CONTENT

Driver ADSP Board, Rev 1 5/13/87
Uses ADSP-2100 Rev 3
68010 Stuff:

;ram Memory:

To Access Program Memory Set Flag ADSPBR Low.
Program Memory is accessed as 8K Longwords with the low 24 bits used.
Set Flag ADSPBR High.

The ADSP Program Memory is accessible immediately after setting ADSPBR Low.

===

Data Memory:

To Access Data Memory Set Flag ADSPBR Low.
Data Memory is accessed as 8K Words.
Set Flag ADSPBR High.

The ADSP Data Memory is accessible immediately after setting ADSPBR Low.

===

Sequential Output Memory:

Set /BCON Low - The 68010 sees Sequential Output Memory #1.
The ADSP-2100 sees Sequential Output Memory #2.

Set /BCON high - The 68010 sees Sequential Output Memory #2.
The ADSP-2100 sees Sequential Output Memory #1.

==========

ADSP Memory Map

Program Memory	0000 - 1FFF	(8K x 24)	
a Memory	0000 - 1FFF	(8K x 16)	
	2000	SIMBUF	Read the Sequential Input Memory; Increment the Address.

It is necessary to follow a SIMBUF read with two NOPs (or other instructions) before doing another SIMBUF read.

2001	SIMLD	Write Data to Sequential Input Memory Address Counter

It is necessary to follow a SIMLD write with two NOPs (or other instructions) before doing a SIMBUF read.

2002	SOMD	Write Data to Sequential Output Memory; Increment Address

It is necessary to follow a SOMD write with one NOP (or other instruction) before doing another SOMD write.

2003	SOMLD	Write Data to Sequential Output Memory Address Counter
2005	XOUT	Write D0 to Latch which can be read by 68010
2006	GINT	Generate 68010 Interrupt 2
2007	MPAGE	Write DMD0 to Memory Page Select (For Sequential Input Memory)

Notes:
1. 2000 and 2004 must be READ only.
2. 2001, 2002, 2003, 2005, 2006, and 2007 should be WRITTEN to only.
3. The Sequential Input Memory consists of two 64K Word Pages, Selected by MPAGE. Sequential access will not cross the page.
4. The Sequential Output Memory is actually two independent memories. The 68010 selects which one is used by whom.

ADSP Memory Map - Short Form

Program Memory	0000 - 1FFF	(8K x 24)	
Data Memory	0000 - 1FFF	(8K x 16)	
	2000	SIMBUF	Read the Sequential Input Memory; Increment the Address.

It is necessary to follow a SIMBUF read with two NOPs (or other instructions) before doing another SIMBUF read.

2001	SIMLD	Write Data to Sequential Input Memory Address Counter

It is necessary to follow a SIMLD write with two NOPs (or other instructions) before doing a SIMBUF read.

2002	SOMD	Write Data to Sequential Output Memory; Increment Address

It is necessary to follow a SOMD write with one NOP (or other instruction) before doing another SOMD write.

2003	SOMLD	Write Data to Sequential Output Memory Address Counter
2005	XOUT	Write D0 to Latch which can be read by 68010
2006	GINT	Generate 68010 Interrupt 2
2007	MPAGE	Write DMD0 to Memory Page Select (For Sequential Input Memory)

Notes:
1. 2000 and 2004 must be READ only.
2. 2001, 2002, 2003, 2005, 2006, and 2007 should be WRITTEN to only.
3. The Sequential Input Memory consists of two 64K Word Pages, Selected by MPAGE. Sequential access will not cross the page.
4. The Sequential Output Memory is actually two independent memories. The 68010 selects which one is used by whom.

Timing For ADSP-2100 System 4 Board
Using Data Sheet for Revised ADSP-2100, August 22, 1986
d Margolin 7/7/86, 7/17/86, 7/29/86, 8/25/86

Old Memory Reads:

Program Memory Address (PMA) Valid to Program Memory Data (PMD) required = 50 ns

Therefore, Program Memory Access Time: 50 ns

Data Memory Address (DMA) Valid to Data Memory Data (DMD) required = 57 ns
Therefore, Data Memory Access Time: 57 ns

New Memory Reads:

Program Memory Address (PMA) Valid to Program Memory Data (PMD) required = 50 ns

Therefore, Program Memory Access Time: 50 ns

RAM access = 50 ns - 5 ns (Address Decoding) = 45 ns max

Data Memory Address (DMA) Valid to Data Memory Data (DMD) required = 57 ns
Therefore, Data Memory Access Time: 57 ns

RAM access = 57 ns - 10 ns (Address Decoding) = 47 ns max

New Signals:

Data Memory Select (/DMS), same timing as DMA, usable as chip select.

Program Memory Select (/PMS), same timing as PMA, usable as chip select.

Program Memory Read (/PMRD), Read Strobe, usable as output enable.
(Note: Fast RAMs do not have a separate output enable.)

PMA Valid to /PMRD Low = 10 ns min
/PMRD Low to PMD Required = 37 ns max
/PMRD High to PMA Invalid = 16 ns

/PMRD Width = 49 ns min

Data Memory Read (/DMRD), Read Strobe, usable as output enable
(Note: Fast RAMs do not have a separate output enable.)

DMA Valid to /DMRD Low = 16 ns
/DMRD Low to DMD Required = 40 ns max
/DMRD High to DMA Invalid = 16 ns

/DMRD Width = 49 ns min

Old Memory Writes:

DMD Out Valid to /DMWR High = 28 ns min
PMD Out Valid to /PMWR High = 20 ns min

New Memory Writes:

ID Out Valid to /DMWR High = 28 ns min
ID Out Valid to /PMWR High = 20 ns min

======

Memory Requirements:

Tacc = 45 ns min
Address Setup to Write Start = 0 ns
Write Pulse Width = 49 ns
Data Set up to end of Write = 20 ns max

=====

Cypress 45 ns RAM (CY7C168):

Program Memory Access Time: 50 ns
5 ns memory select + 45 ns RAM access = 50 ns (ok)

Data Memory Access Time: 57 ns
9 ns memory select + 45 ns RAM access = 54 ns (ok)

Program Memory Write pulse: 49 ns
RAM Write pulse = 35 ns (ok)

Data Memory Write pulse = 49 ns
RAM Write pulse = 35 ns (ok)

Data Valid to End of Write = 28 ns DM
ata Valid to End of Write = 20 ns PM

RAM Data Setup to End of Write = 15 ns min (ok)

Data Hold = 22 ns
RAM requirement = 3 ns (ok)

Program Memory Address Setup to Start of Write = 4 ns min
Data Memory Address Setup to Start of Write = 6 ns min
RAM requirement = 0 ns (ok)

Program Memory Address Setup to End of Write = 59 ns min
Data Memory Address Setup to End of Write = 64 ns min
RAM requirement = 35 ns

======

After the ADSP reads the Sequential Input Memory (SIMBUF) and increments the EPROM address, the next memory access has to wait at least 216 ns before it can be read again. [ALS169 = 16ns + 27256 200ns].

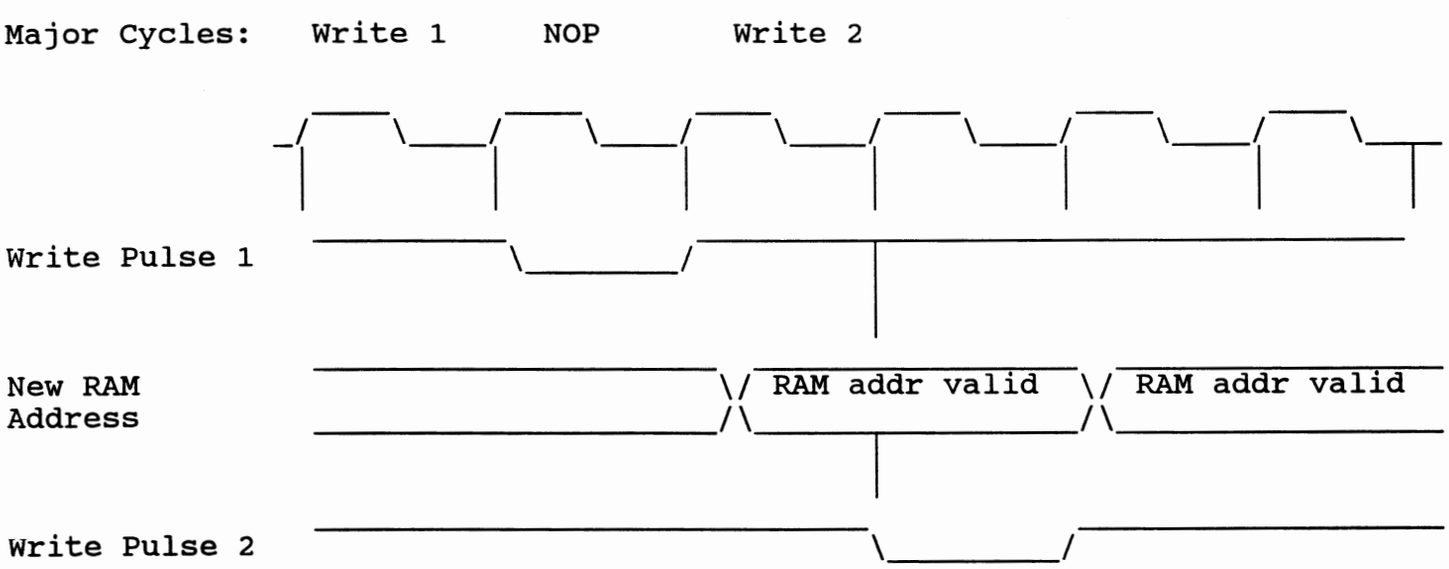
For a SIMBUF read followed by a NOP followed by another SIMBUF read:
Start at end of SIMBUF: ALS169 = 16ns, 27256 = 200ns, LS244 = 18 ns. Total is 234 ns. The data is therefore available 16 ns before the end of the second SIMBUF read. The data must be stable 3 ns before Clk 7/8. The signal that increments the ALS169s is 1 half-clock plus gate delays after Clk 7/8 for total of ~26 ns. The Data must be available 29ns less than 2 major cycles or 221ns. This would require EPROM with 221-16-18 = 187ns.

It is therefore necessary to follow a SIMBUF read with two NOPs (or other instructions) before doing another SIMBUF read.

e alternative is to use 170ns EPROM.
==

After the ADSP writes to the Sequential Output Memory (SOMD) it must wait at least 1 Instruction cycle before writing to it again.

When it writes to it the Data is captured in a latch which extends the memory write until the end of the next instruction. (The ADSP can be doing another instruction). The Sequential Output Memory is then incremented. (The ALS569 takes 16 ns.)



=====
Bus Request (For Both Program and Data Memories):

BR is recognized during clock cycles 3/4 and tri-states the bus about 2 half-cycles after the next clock cycle 3/4. (about 150 ns total). If BR is asserted during clock cycles 4/5, this will add about 125 ns to the access time for a total of 275 ns worst case.

The 68010 should be able to Set ADSPBR Low and begin accessing memory with its next instruction.
=====
Nitty Gritty

/SIMBUF = Read the Sequential Input Memory and increment the Address Counter.

There is a worst case delay of 9.0 ns from Data Memory Address Valid to /SIMBUF. /DMS low to /DMRD low is 16 ns min, so there will not be any glitches on the clock low. The total delay from /DMRD low to the Counter Clock Input low is 'AS08 + 'AS32 = 9 ns.

/DMRD low to Data Memory Data In Required = 40 ns max
(LS244 prop delay is 18 ns max)

/DMRD high to Data Memory Address Invalid is 16 ns min. The Counter Clock Input will go high 9 ns after /DMRD high with no glitches.

All of the decoded writes are strobed by /DMWR and are therefore delayed 8 ns coming and going.

/DMWR high to Address Invalid = 16 ns min
/DMWR high to Data Out Invalid = 22 ns min

Therefore the Decoded Writes will go high with both address and data valid.

/SIMLD = Write to the Sequential Input Memory Address Counter

/SIMCLK to load the counters will be delayed an additional 4 ns with no problem.

/SIMLD low will be valid 20 ns before /SIMLD. It will be at least 49 ns bwfore /SIMCLK goes high. The ALS169 has a Load setup time of 15 ns.

SOMLATCH = Write to the Sequential Output Memory Data Latch.

SOMLATCH is delayed 4 ns from the decoded write strobe with no problem. (The LS373 has 0 setup time and 10 ns hold time.)

/SOMD = SOMLATCH decoded address, is guaranteed to be valid when CLKOUT goes high. Generates an extended Memory Write for the 6264s.
CLKIN low (7-8) to CLKOUT high is 8 - 19 ns.
CLKIN high (8-1) to /DMS invalid is 14 ns min.
CLKIN Low (7-8) to CLIKIN high (8-1) is 15 ns so that CLKOUT high must occur (at the very latest) 3 ns after CLKIN high (8-1) which is 16 ns before /DMS invalid.

/XIN = Read the Auxiliary Input Buffer (A decoded Read)

/XOUT = Write to the Auxiliary Output Latch (A Write Pulse)

/GINT = Generate a 68010 Interrupt (A Write Pulse)

/MP = Select the Memory Page (A Write Pulse)

Title / ASSY,SUB,DRIVER ADSP	P/L A044421-01	Rev / B
GAMES ENGINEERING PARTS LIST SPECIFICATION	PROJECT: DRIVING SIMULATOR	Page 1 of 2

ATARI GAMES

Drawn by: G. POPKIN	Next Assy:
Checked by: A.JACKSON	
Design Eng: JED MARGOLIN	Comp. Eng:
Proj. Eng: R.MONCRIEF	Mfg. Eng: WRIGHTNOUR
Ind. Design:	Qual. Eng:

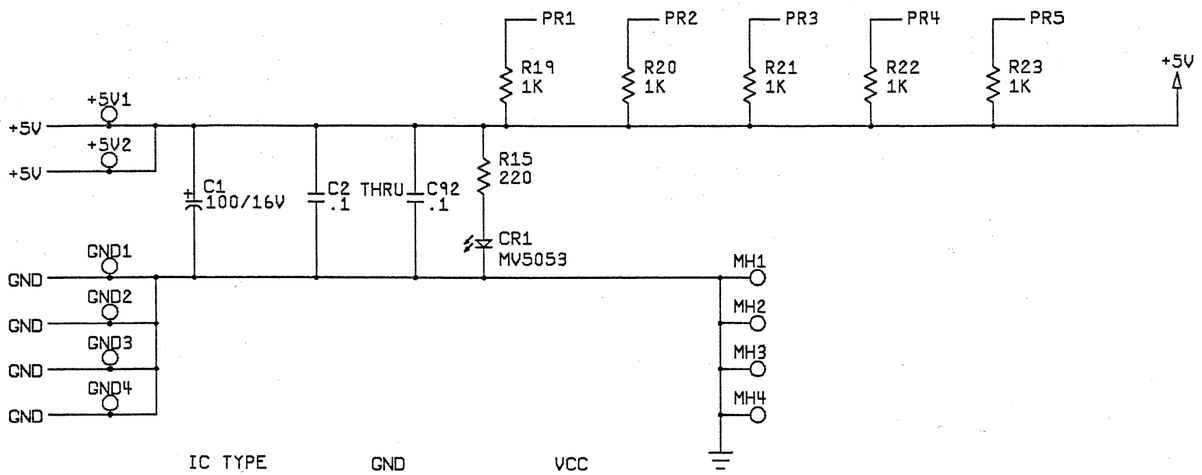
REV	DESCRIPTION	DATE	APPR	REV	DESCRIPTION	DATE	APPR
A	PRODUCTION RELEASE	8/88					
B	ECN 13214	12-2-88					

ITEM	PART NO	QTY	Description	Ref. Designators
1	044422-01	1	P.C. Board	
2				
3				
4				
5	122002-104	91	CAP, .1µF, 50V, CER	C2-92
6	124008-107	1	CAP, 100µF, 16V, ELEC	C1
7				
8	179021-060	1	CONN, HDR, 60 CKT, 4 WALL, .1 X .1C	J1
9				
10	131027-002	3	DIODE, MV5053, LIGHT EMIT	CR1-3
11				
12				
13				
14	144008-002	1	IC, 32MHZ CLOCK MODULE	X1
15				
16				
17				
18				
19	110000-103	15	RES, 10K, 5%, 1/4W	R1-12,R16-18
20	110000-151	2	RES, 150, 5%, 1/4W	R13,R14
21	110000-102	5	RES, 1K, 5%, 1/4W	R19-23
22	110000-221	1	RES, 220, 5%, 1/4W	R15
23				
24				
25				
26	79-42C28	4	SOCKET, 28 PIN	10H,10J,10K,10L
27	179236-001	1	SOCKET, IC, PGA, 101 CKT, LIF	ADSP2100
28				
29				
30	179051-001	6	TEST POINT	+5V1,+5V2,GND1-4
31				
32	137517-001	2	IC, 74ALS138	7B,7C
33	137471-001	4	IC, 74ALS169	9L,9K,9J,9H
34	137464-001	1	IC, 74ALS32	7A
35	137476-001	8	IC, 74ALS569	4A,4B,4C,4D,4E,4F, 4H,4J

Title / ASSY,SUB,DRIVER ADSP	P/L A044421-01	REV / B
GAMES ENGINEERING PARTS LIST SPECIFICATION	PROJECT: DRIVING SIMULATOR	Page 2 of 2

ITEM	PART NO	QTY	Description	Ref. Designators
36	137156-001	2	IC, 74ALS74	7L,6K
37	137480-001	1	IC, 74AS00	8K
38	137433-001	1	IC, 74AS04	6L
39	137484-001	1	IC, 74AS08	5L
40	137522-001	2	IC, 74AS138	5K,7J
41	137487-001	2	IC, 74AS32	6J,8H
42	137038-001	13	IC, 74LS244	3C,3D,3E,3F,3K,6C, 6D,7D,8C,8D,8F,8J,8L
43	137134-001	9	IC, 74LS245	1D,1E,2D,2E,6A,6B, 8A,8B,8E
44	37-74LS259	1	IC, 74LS259	7K
45	137143-001	4	IC, 74LS373	1C,1F,2C,2F
46				
47				
48				
49	137537-003	20	IC, SRAM, 4KX4, (8168D45)	5A,5B,5C,5D,5E,5F,5H, 5J,9A,9B,9C,9D,9E,9F, 10A,10B,10C,10D,10E, 10F
50	137535-006	4	IC, SRAM, 8KX8, (6264D15)	1H,3H,1A/B,3A/B

REVISIONS					
SYM	DESCRIPTION	DATE	INCORP	CHECK	APPROVED
A	PRODUCTION RELEASE	7-18 1988	GRP	R.L.	gm RM
B	ECN-13214	11-21 1988	LBF	G.P.	gm



IC TYPE	GND	VCC
74LS00	7	14
74LS08	7	14
74LS175	8	16
74LS244	10	20
74LS245	10	20
74LS253	8	16
74LS259	8	16
74LS373	10	20
74LS374	10	20
74ALS20	7	14
74ALS32	7	14
74ALS74	7	14
74ALS138	8	16
74ALS169	8	16
74ALS569	10	20
74AS00	7	14
74AS04	7	14
74AS08	7	14
74AS32	7	14
74AS74	7	14
74AS138	8	16
4K X 4 SRAM	10	20
8K X 8 SRAM	14	28
27512	14	28
ADSP2100	18 26 36 39 61 68 79 90 100	15 40 64 89

ADSP - 2100
PIN LOCATIONS

	1	2	3	4	5	6	7	8	9	10	11	12	13
N	25 DMA0	27 RESET	29 HALT	31 TRAP	33 PMS	36 GND	39 GND	40 VDD	43 BG	45 PMD23	47 PMD21	48 PMD20	50 PMD18
M	23 DMA2	26 GND	28 DMACK	30 PMDA	32 DMS	35 DMWR	37 DMRD	41 BR	44 PMRD	46 PMD22	49 PMD19	51 PMD17	52 PMD16
L	22 DMA3	24 DMA1				34 PMWR	38 CLK1	42 CLK0				53 PMD15	54 PMD14
K	20 DMA5	21 DMA4										55 PMD13	56 PMD12
J	18 GND	19 DMA6										57 PMD11	58 PMD10
H	15 VDD	16 DMA8	17 DMA7								59 PMD9	60 PMD8	61 GND
G	14 DMA9	12 DMA11	13 DMA10								63 PMD6	62 PMD7	64 VDD
F	11 DMA12	10 DMA13	9 DMA15								67 PMD3	66 PMD4	65 PMD5
E	8 DMD14	7 DMD13										69 PMD2	68 GND
D	6 DMD12	5 DMD11										71 PMD0	70 PMD1
C	4 DMD10	3 DMD9	INDEX PIN			92 IRQ0	88 IRQ2	84 PMA11				74 PMA2	72 PMA0
B	2 DMD8	1 DMD7	99 DMD6	96 DMD3	94 DMD1	91 IRQ1	87 IRQ3	85 PMA12	82 PMA9	80 PMA7	78 PMA6	76 PMA4	73 PMA1
A	100 GND	98 DMD5	97 DMD4	95 DMD2	93 DMD0	90 GND	89 VDD	86 PMA13	83 PMA10	81 PMA8	79 GND	77 PMA5	75 PMA3

BOTTOM VIEW
(PINS UP)

A044421-21	DRIVING SIMULATOR
NEXT ASSY	FIRST USED ON

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON:
ANGLES ± 1°
.XX =± .01
.XXX =± .005

MATERIAL:
SEE PL
A044421-01
A045739-01

FINISH:

		DATE
DRAWN BY	G POPKIN	7-18-88
CHECKED BY	C.J.	8-2-88
ENGR.ELECT	J. Magdin	8-2-88
PROJ ENGR	L. Morningstar	8-2-88
MFG ENGR	Linda Thompson	8-3-88

ATARI
ATARI GAMES CORP.
675 SYCAMORE DRIVE
MILPITAS, CA. 95035

TITLE
SCHEMATIC
DRIVER ADSP

SIZE	DRAWING NO.	REV
D	044421-01	B
SCALE NONE	SHEET 1 OF 9	

SCHSHT1 A

AM/PM1

J1-1 A01
J1-2 A02
J1-3 A03
J1-4 A04
J1-5 A05
J1-6 A06
J1-7 A07
J1-8 A08
J1-9 A09
J1-10 A10
J1-11 A11
J1-12 A12
J1-13 A13
J1-14 A14
J1-15 A15
J1-16 A16
J1-17 A17
J1-18 A18
J1-19 A19
J1-20 A20
J1-21
J1-22
J1-23 /EXT
J1-24 (/AS) +5V
J1-25
J1-26
J1-27 RWN
J1-28 /RVAS
J1-29 /RWS

AM/PM1

J1-30 D00
J1-31 D01
J1-32 D02
J1-33 D03
J1-34 D04
J1-35 D05
J1-36 D06
J1-37 D07
J1-38 D08
J1-39 D09
J1-40 D10
J1-41 D11
J1-42 D12
J1-43 D13
J1-44 D14
J1-45 D15
J1-46
J1-47
J1-48 (/MHALT)
J1-49 (/MRESET)
J1-50
J1-51 (/LINKIRQ)
J1-52 (/WEU)
J1-53 (/WEL)
J1-54 /ADSPIRQ +5V
J1-55
J1-56
J1-57 (SC8MA)
J1-58
J1-59 (SC16MA)
J1-60

RWN — 6L 74AS04 — /RWN

A18 — 6L 74AS04

A19, A20 — 7A 74ALS32

7B 74ALS138
G1 ← +5V
G2A ← 7A
G2B ← /EXT
SELC ← A17
SELB ← A16
SELA ← A15
Y7 → /READSTAT
Y6 → (unused)
Y5 → (unused)
Y4 → (unused)
Y3 → /ASEL
Y2 → /BUFFERMEM
Y1 → /DATAMEM
Y0 → /PROGMEM

/RVAS — 7A 74ALS32 — /DATAMEM

/RVAS — 7A 74ALS32 — /PROGMEM

7C 74ALS138
PR4 → +5V
/RWS → /RWS
/ASEL → /ASEL
BA07 → SELC
BA06 → SELB
BA05 → SELA
Y3 → /CGINT
Y0 → /LATCHES

7D 74ALS244
PR4 → +5V
A07 ← BA07
A06 ← BA06
A05 ← BA05
A04 ← BA04
A03 ← BA03
A02 ← BA02
A01 ← BA01
/1G /2G ← GND

74LS259
BA04 → 7K
BA03 → DI
BA02 → SELC
BA01 → SELB
/LATCHES → SELA
PR3 → G
CLR ← +5V
Q7 → /ADSPRES
Q6 → /ADSPHALT
Q5 → /ADSPBR
Q3 → /BCON

/BCON — 6L 74AS04 — BCON

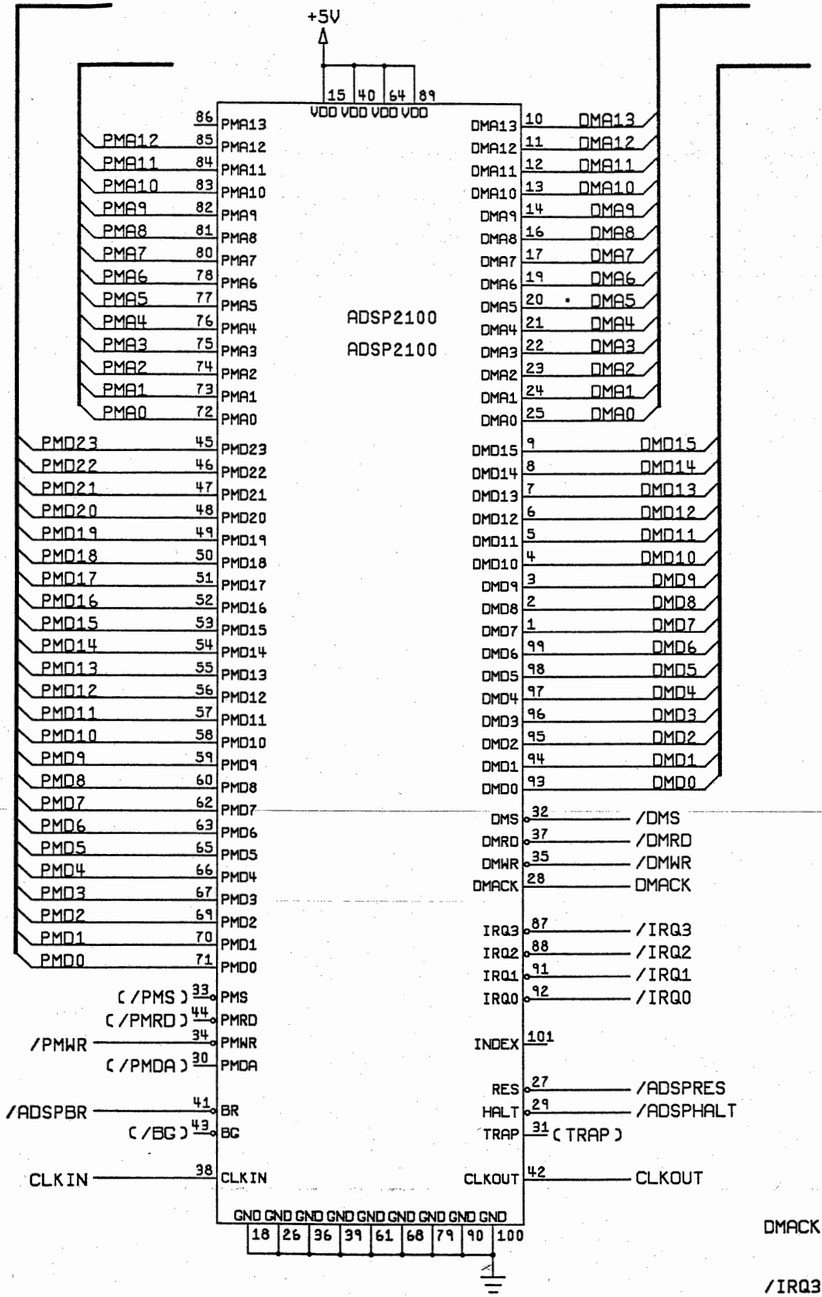
+5V — R13 150 — MV5053 CR2
+5V — R14 150 — MV5053 CR3

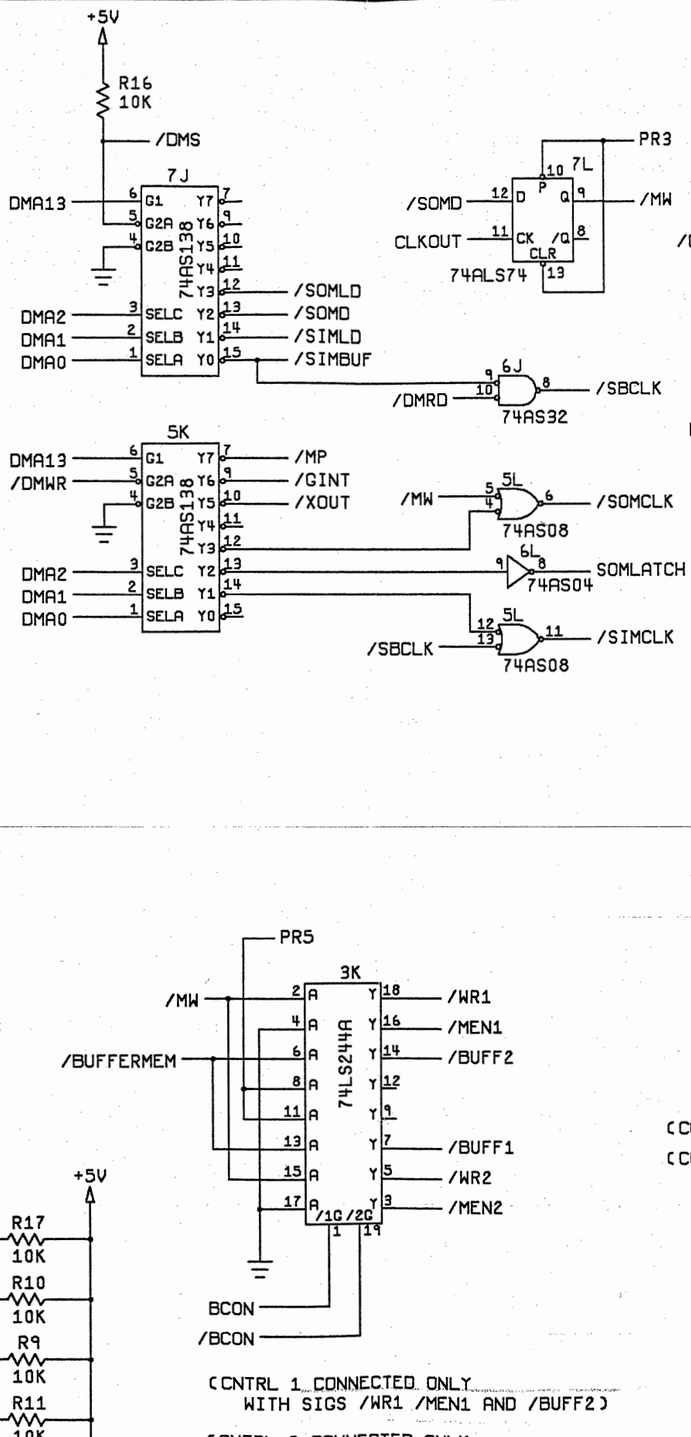
ATARI
ATARI GAMES CORP.
675 SYCAMORE DRIVE
MILPITAS, CA. 95035

TITLE
SCHEMATIC
DRIVER ADSP

SIZE	DRAWING NO.	REV
D	044421-01	B
SCALE NONE	SHEET 2 OF 9	

SCHSHT2 A





(CONTROL 1 CONNECTED ONLY WITH SIGNAL /ADSPIRQ
(CONTROL 2 CONNECTED ONLY WITH SIGNALS D00 THRU D03)

XTAL OSC

(CNTRL 1 CONNECTED ONLY
WITH SIGS /WR1 /MEN1 AND /BUFF2)

(CNTRL 2 CONNECTED ONLY
WITH SIGS /WR2 /MEN2 AND /BUFF1)

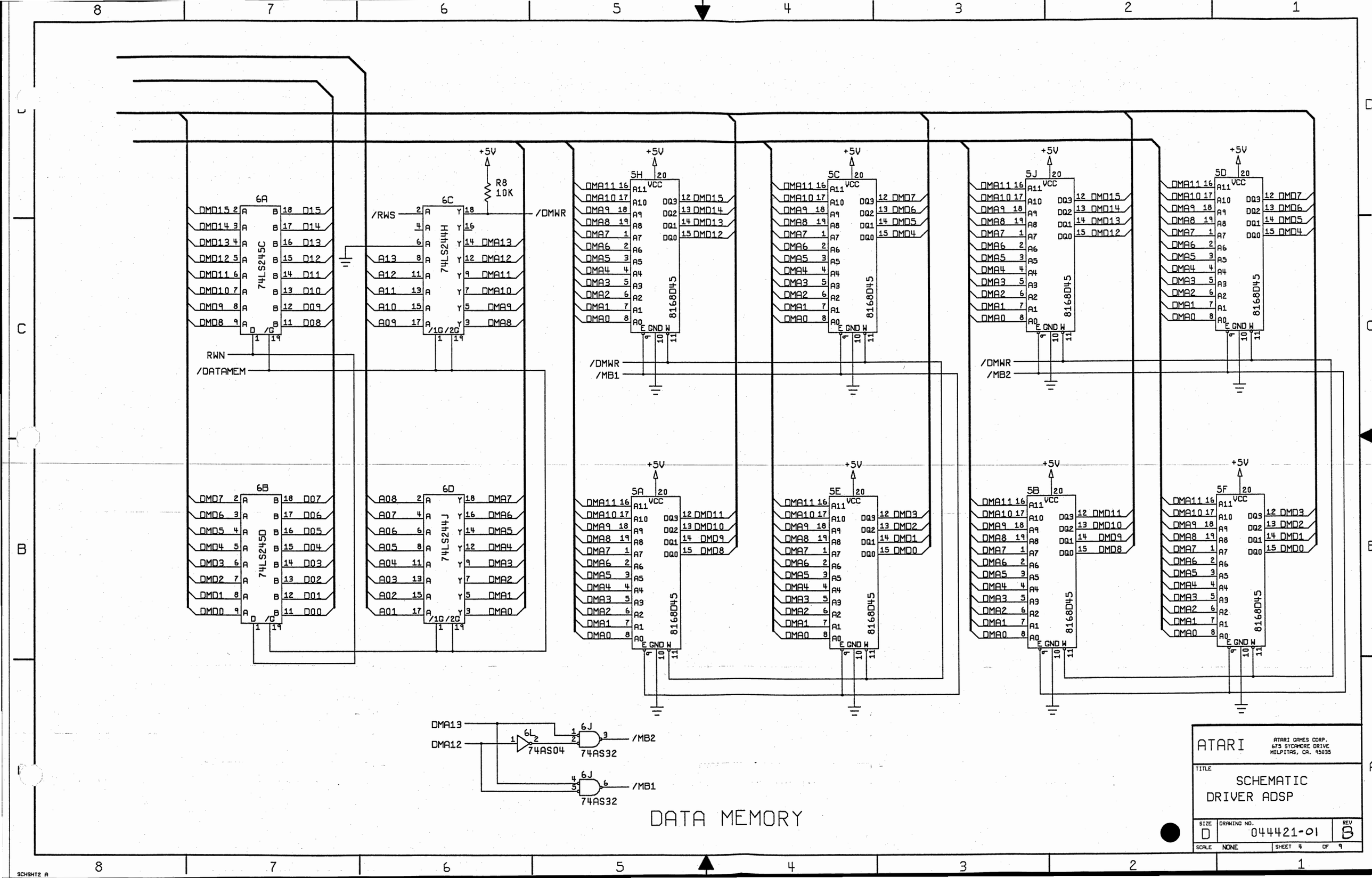
ATARI ATARI GAMES CORP. 675 SYCAMORE DRIVE MILPITAS, CA. 95035

TITLE
SCHEMATIC
DRIVER_ADSP

SIZE	DRAWING NO.	REV
D	044421-01	B

SCALE NONE SHEET 3 OF 9

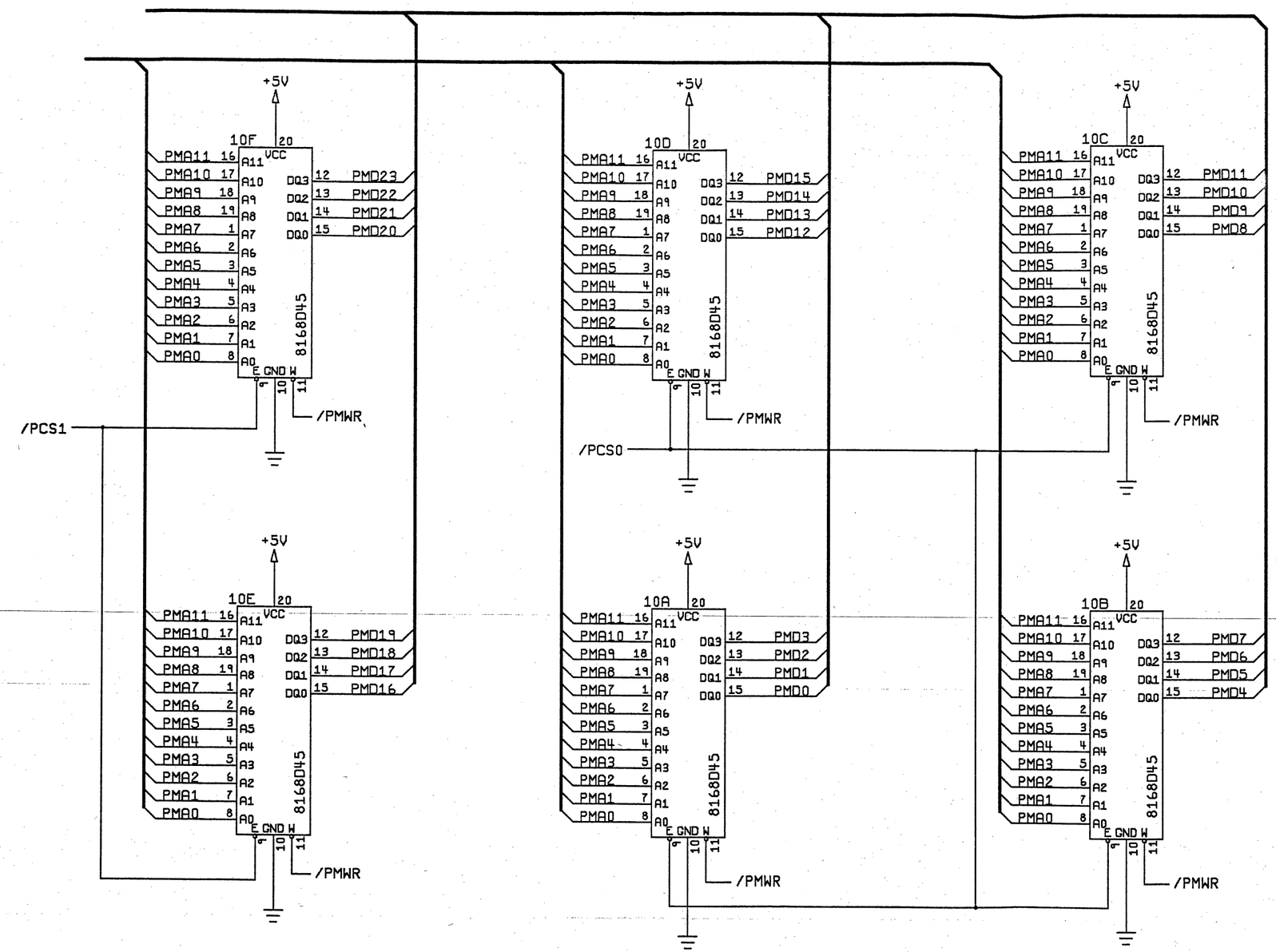
SCHSHT2.A

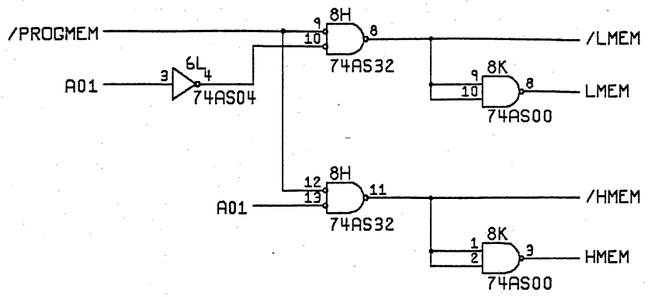


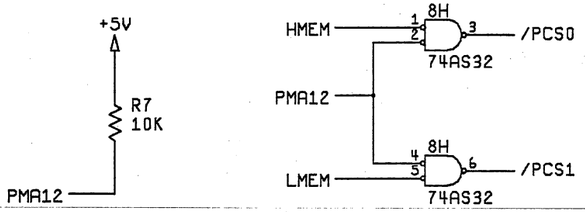
DATA MEMORY

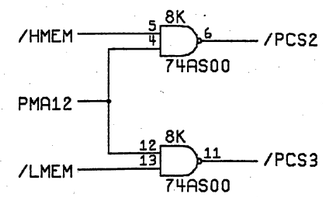
ATARI	ATARI GAMES CORP. 675 SYCAMORE DRIVE MILPITAS, CA. 95035
TITLE	SCHEMATIC DRIVER ADSP
SIZE D	DRAWING NO. 044421-01 REV B
SCALE NONE	SHEET 4 OF 9

SCHSHT2 A









PROGRAM MEMORY

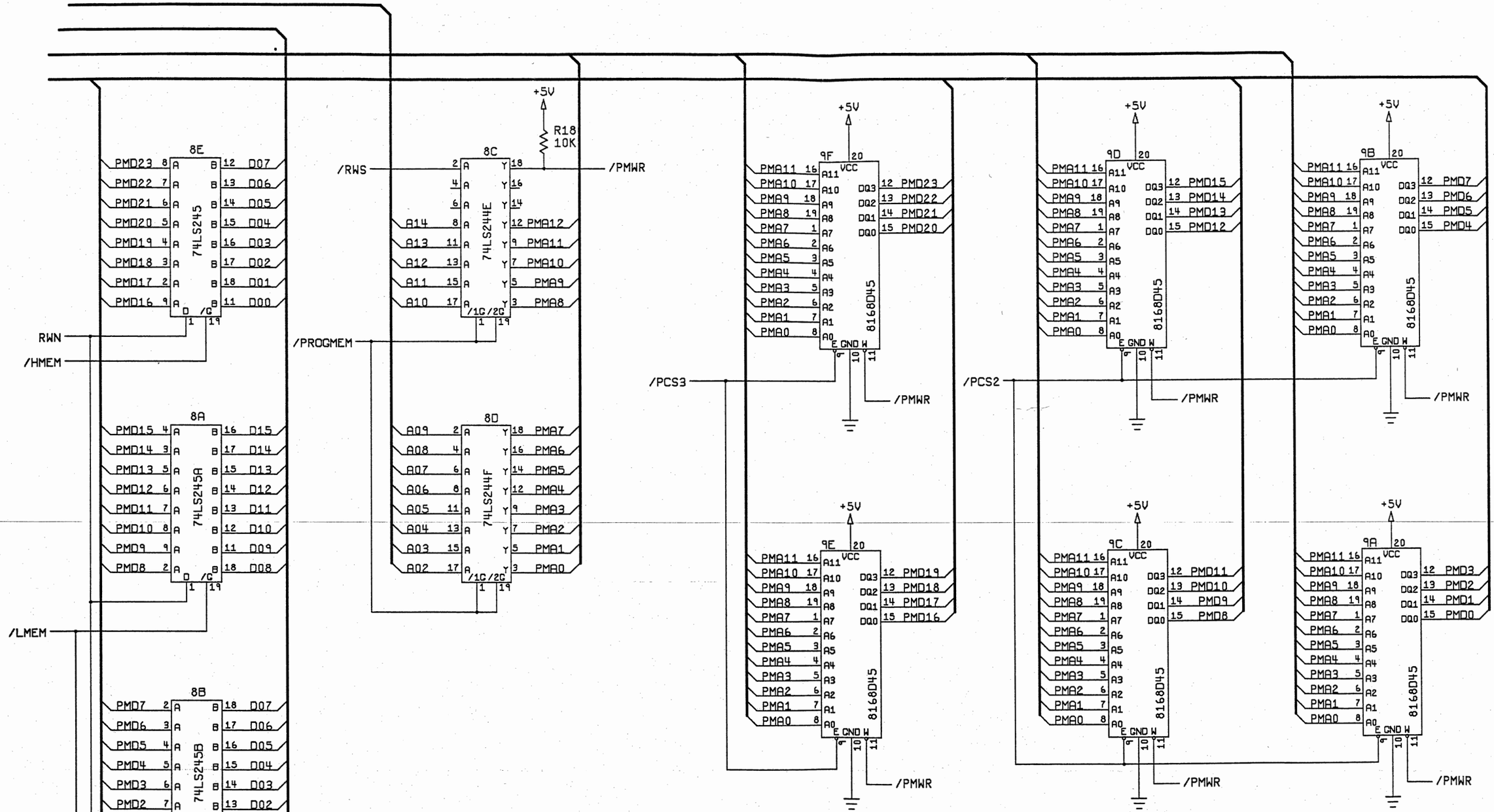
ATARI — ATARI GAMES CORP. 675 SYCAMORE DRIVE MILPITAS, CA. 95035

TITLE: SCHEMATIC DRIVER ADSP

SIZE D | DRAWING NO. 044421-01 | REV B

SCALE NONE | SHEET 5 OF 9

SCHSHT2 A



PROGRAM MEMORY /BUFFERS

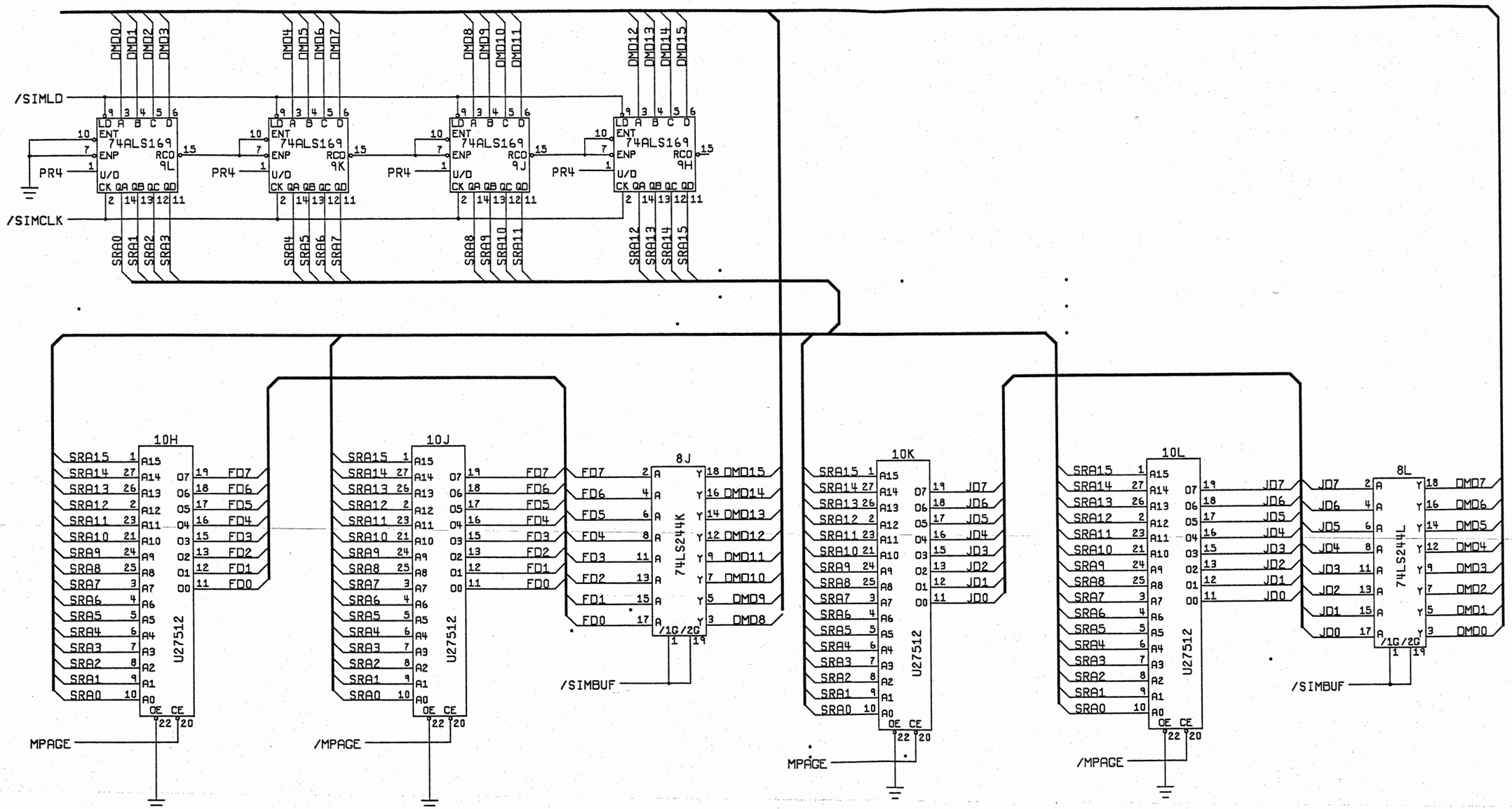
ATARI

ATARI GAMES CORP.
675 SYCAMORE DRIVE
MILPITAS, CA. 95035

TITLE
SCHEMATIC
DRIVER ADSP

SIZE	DRAWING NO.	REV
D	044421-01	B
SCALE NONE	SHEET 6 OF 9	

SCHSHT2 A



SEQUENTIAL INPUT MEMORY

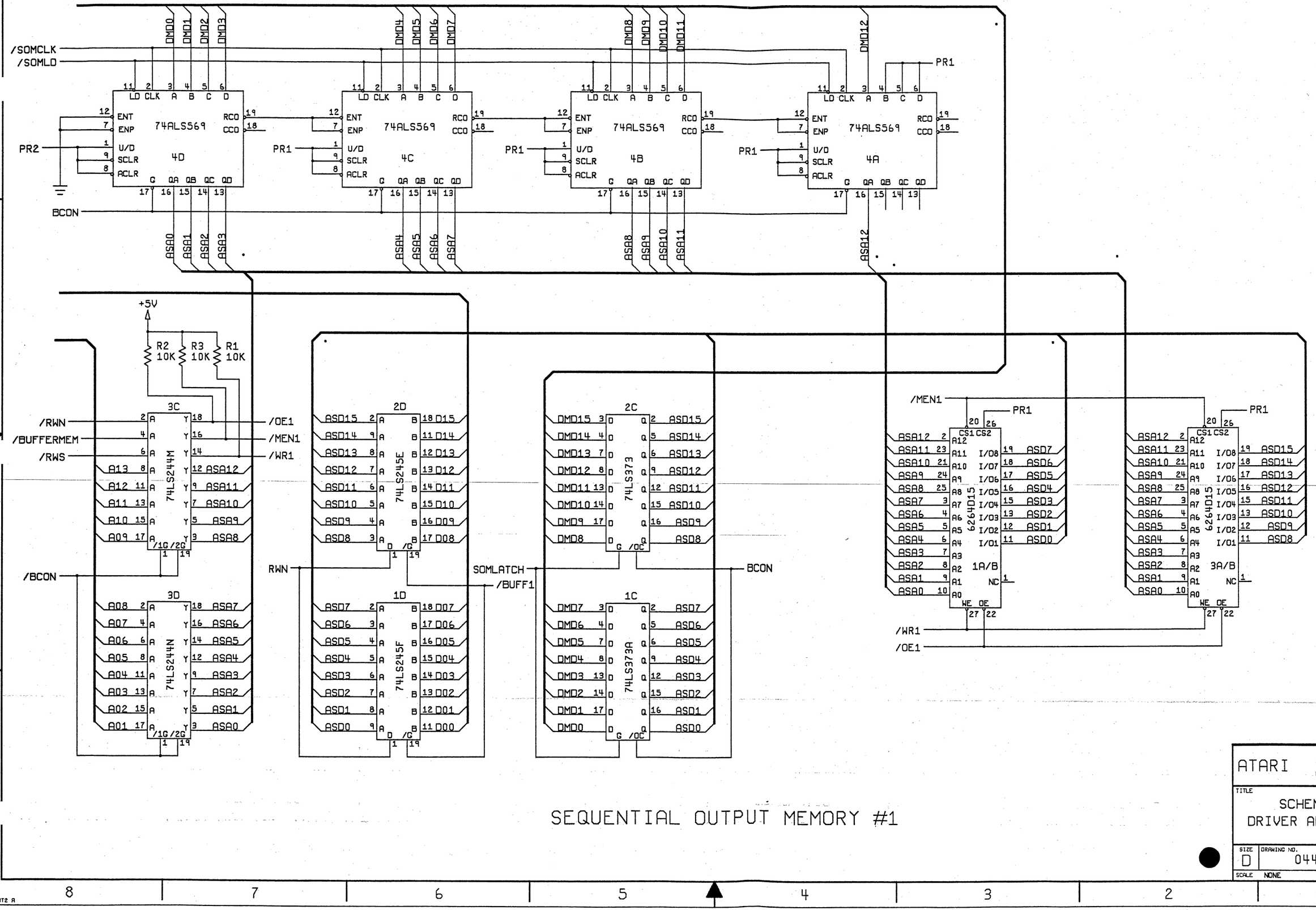
ATARI — ATARI GAMES CORP. 675 SYCAMORE DRIVE MILPITAS, CA. 95035

TITLE: SCHEMATIC DRIVER ADSP

SIZE D | DRAWING NO. 044421-01 | REV B

SCALE NONE | SHEET 7 OF 9

SCHSHT2 A



SEQUENTIAL OUTPUT MEMORY #1

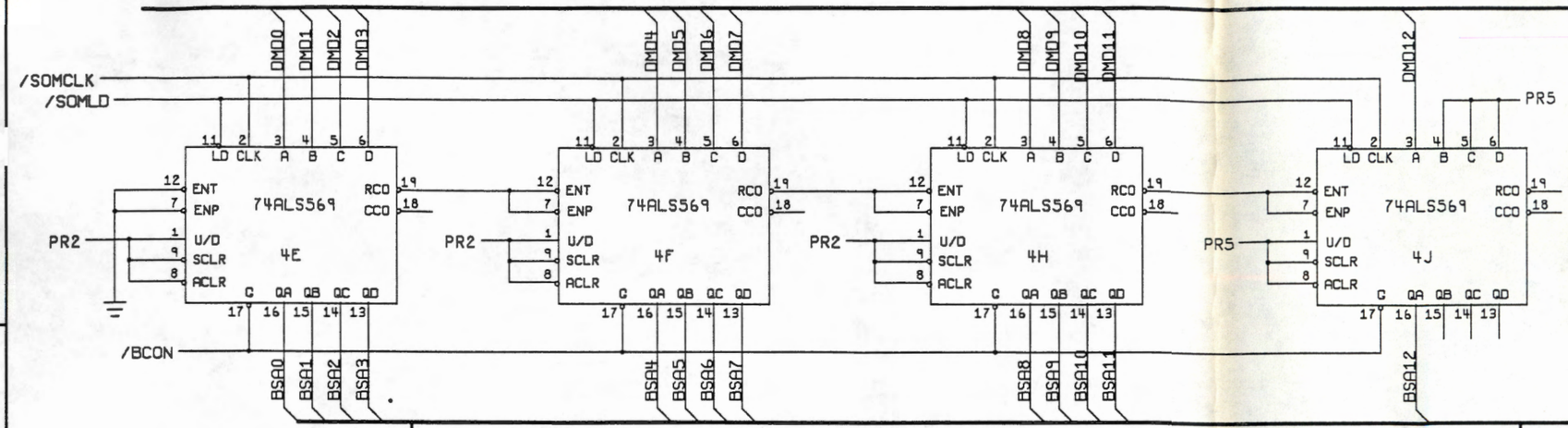
ATARI

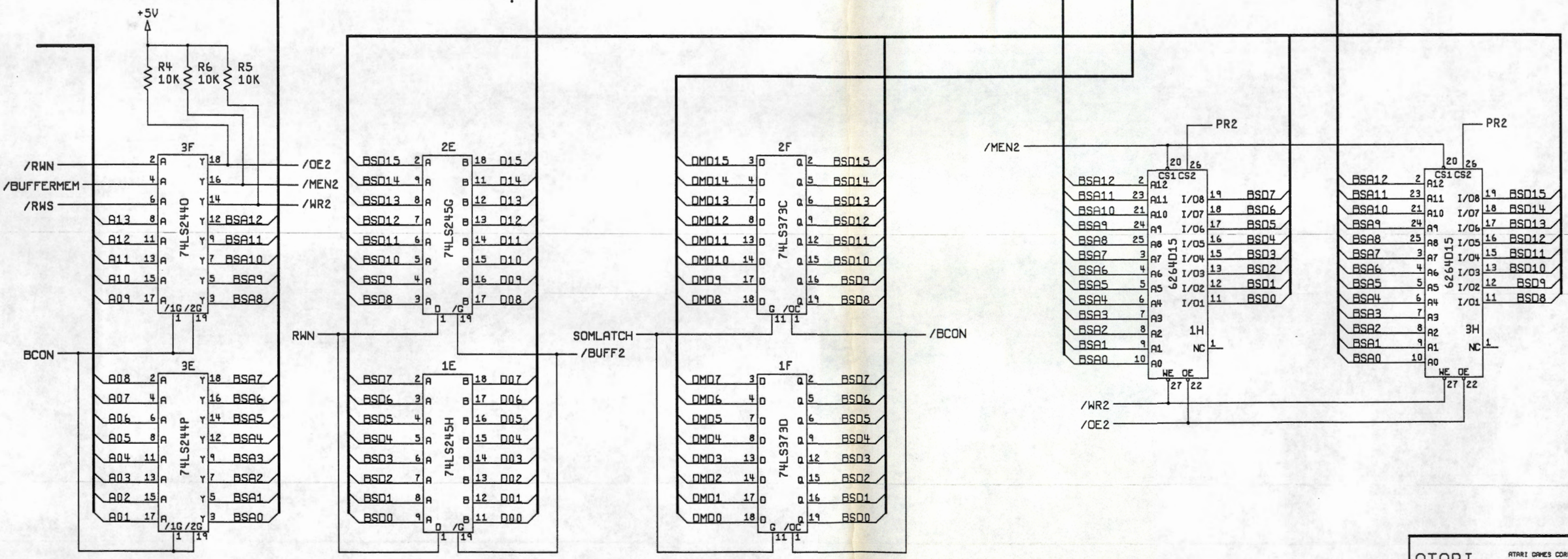
ATARI GAMES CORP.
675 SYCAMORE DRIVE
MILPITAS, CA. 95035

TITLE
SCHEMATIC
DRIVER ADSP

SIZE	DRAWING NO.	REV
D	044421-01	B
SCALE NONE	SHEET 8 OF 9	

SCHSHT2 A





SEQUENTIAL OUTPUT MEMORY #2

ATARI

ATARI GAMES CORP.
675 SYCAMORE DRIVE
MILPITAS, CA. 95035

TITLE
SCHEMATIC
DRIVER ADSP

SIZE	DRAWING NO.	REV
D	044421-01	B
SCALE NONE	SHEET 9 OF 9	

SCHSHTZ A

Tab - “ADSP II”

Title / ASSY, SUB, ADSP II PCB	P/L A047047-01	Rev / C
GAMES ENGINEERING PARTS LIST SPECIFICATION	PROJECT: H.D.	

ATARI GAMES

Drawn by: L.FRITTS	Next Assy:
Checked by:	A047046-01,02
Design Eng:	Comp. Eng:
Proj. Eng:	Mfg. Eng:
Ind. Design:	Qual. Eng:

REV	DESCRIPTION	DATE	APPR	REV	DESCRIPTION	DATE	APPR
A	PRODUCTION REL	6/89					
B	REVISED PER ECN 13811	4/90					
C	REVISED PER ECN 13954	8-10-90	JM				

ITEM	PART NO	QTY	Description	Ref. Designators
1	047048-01	1	P.C. Board	
2				
3				
4				
5	122002-104	94	CAP, .1µF, 50V, CER	C2-95
6	124008-107	1	CAP, 100µF, 16V, ELEC	C1
7				
8				
9				
10	179021-060	1	CONN, HDR, 60 CKT .2 CTR	J1
11				
12				
13				
14	131027-002	3	DIODE, MV5053, LIGHT EMIT	CR1-3
15				
16				
17				
18	144008-002	1	IC, 32MHZ CLOCK MODULE	X1
19	137517-001	2	IC, 74ALS138	7B,7C
20	137464-001	1	IC, 74ALS32	7A
21	137476-001	8	IC, 74ALS569	4A,4B,4C,4D,4E,4F,4H, 4J
22	137156-001	2	IC, 74ALS74	6K,7L
23	137480-001	1	IC, 74AS00	8K
24	137433-001	1	IC, 74AS04	6L
25	137484-001	1	IC, 74AS08	5L
26	137522-001	2	IC, 74AS138	5K,7J
27	137487-001	2	IC, 74AS32	6J,8H
28	137097-001	1	IC, 74LS139	8/9J
29	137038-001	13	IC, 74LS244	3C,3D,3E,3F,3K,6C,6D, 7D,8C,8D,8F,8L,8H/J
30	137134-001	9	IC, 74LS245	1D,1E,2D,2E,6A,6B,8A, 8B,8E
31	137137-001	1	IC, 74LS259	7K
32	137143-001	4	IC, 74LS373	1C,1F,2C,2F
33	137537-003	20	IC, SRAM, 4KX4, 45 NS	5A,5B,5C,5D,5E,5F,5H,

Title / ASSY, SUB, ADSP II PCB	P/L A047047-01	REV / C
GAMES ENGINEERING PARTS LIST SPECIFICATION	PROJECT: H.D.	

ITEM	PART NO	QTY	Description	Ref. Designators
				5J,9A,9B,9C,9D,9E,9F, 10A,10B,10C,10D,10E, 10F
34	137471-001	4	IC, 74ALS169	8/9K,8/9L,8/9F/H, 8/9H/J
35	137535-004	4	IC, RAM, 8KX8, 100 NSEC	1H,3H,1A/B,3A/B
36				
37	110000-103	15	RES, 10K, 5%, 1/4W	R1-12,R16-18
38	110000-151	2	RES, 150, 5%, 1/4W	R13,R14
39	110000-102	7	RES, 1K, 5%, 1/4W	R19-23,R48,R49
40	110000-221	1	RES, 220, 5%, 1/4W	R15
41				
42				
43				
44	179257-028	6	SOCKET, 28 PIN, .600"	9H,9K,10H,10K,9/10H, 9/10K
45	179288-001	1	HOUSING, SOCKET, PQFP, 100PIN	ADSP2100
46				
47				
48	179051-001	6	TEST POINT	+5V1,+5V2,GND1-4

Title / ASSY, ADSP II PCB	P/L A047046-02	Rev / B
GAMES ENGINEERING PARTS LIST SPECIFICATION	PROJECT: H.D. COMPACT	Page 1 of 1

ATARI GAMES

Drawn by: L.FRITTS	Next Assy:
Checked by: J.D. 6-21-89	
Design Eng: J. MARGOLIN 6-21-89	Comp. Eng:
Proj. Eng:	Mfg. Eng: D.W. 6-22-89
Ind. Design:	Qual. Eng:

REV	DESCRIPTION	DATE	APPR	REV	DESCRIPTION	DATE	APPR
A	PRODUCTION REL	6/89					
B	ECN 13597		JM				

ITEM	PART NO	QTY	Description	Ref. Designators
1	A047047-01	1	ASSY, SUB, ADSP II PCB	
2				
3				
4				
5	137629-001	1	IC, ADSP-2100, 16 BIT DSP, PQFP	ADSP2100
6	179288-002	1	COVER, IC, PQFP, 100 PIN	ADSP2100
7	136052-1136	1	IC, OTP, 27C512-250, 137454-250	9/10K
8	136052-1135	1	IC, OTP, 27C512-250, 137454-250	9/10H
9	136052-1138	1	IC, OTP, 27C512-250, 137454-250	10K
10	136052-1137	1	IC, OTP, 27C512-250, 137454-250	10H

Title / ASSY, ADSP II PCB	P/L A047046-03	Rev / C
GAMES ENGINEERING PARTS LIST SPECIFICATION	PROJECT: H.D. THE RACE	Page 1 of 1

ATARI GAMES

Drawn by: L.FRITTS Checked by: J.D. 6-21/89	Next Assy:
Design Eng:	Comp. Eng:
Proj. Eng:	Mfg. Eng:
Ind. Design:	Qual. Eng:

REV	DESCRIPTION	DATE	APPR	REV	DESCRIPTION	DATE	APPR
A	PRODUCTION RELEASE						
B	ECN 14023						
C	ECN 14067 G.J. 10-26-90	10-30-90	JM				

ITEM	PART NO	QTY	Description	Ref. Designators
1	A047047-01	1	ASSY, SUB, ADSP II PCB	
2				
3				
4				
5	137629-001	1	IC, ADSP-2100, 16 BIT DSP, PQFP	ADSP2100
6	179288-002	1	COVER, IC, PQFP, 100 PIN	ADSP2100
7	136077-2021	1	IC, EPROM,27512,250NS,137448-250	9/10H
8	136077-2022	1	IC, EPROM,27512 250NS,137448-250	10H
9	136077-2023	1	IC, EPROM,27512 250NS,137448-250	9/10K
10	136077-2024	1	IC, EPROM,27512,250NS,137448-250	10K

Title / ASSY, ADSP II PCB	P/L A047046-04	Rev / A
GAMES ENGINEERING	PROJECT: RACE DRIVIN PANORAMA	

PARTS LIST SPECIFICATION

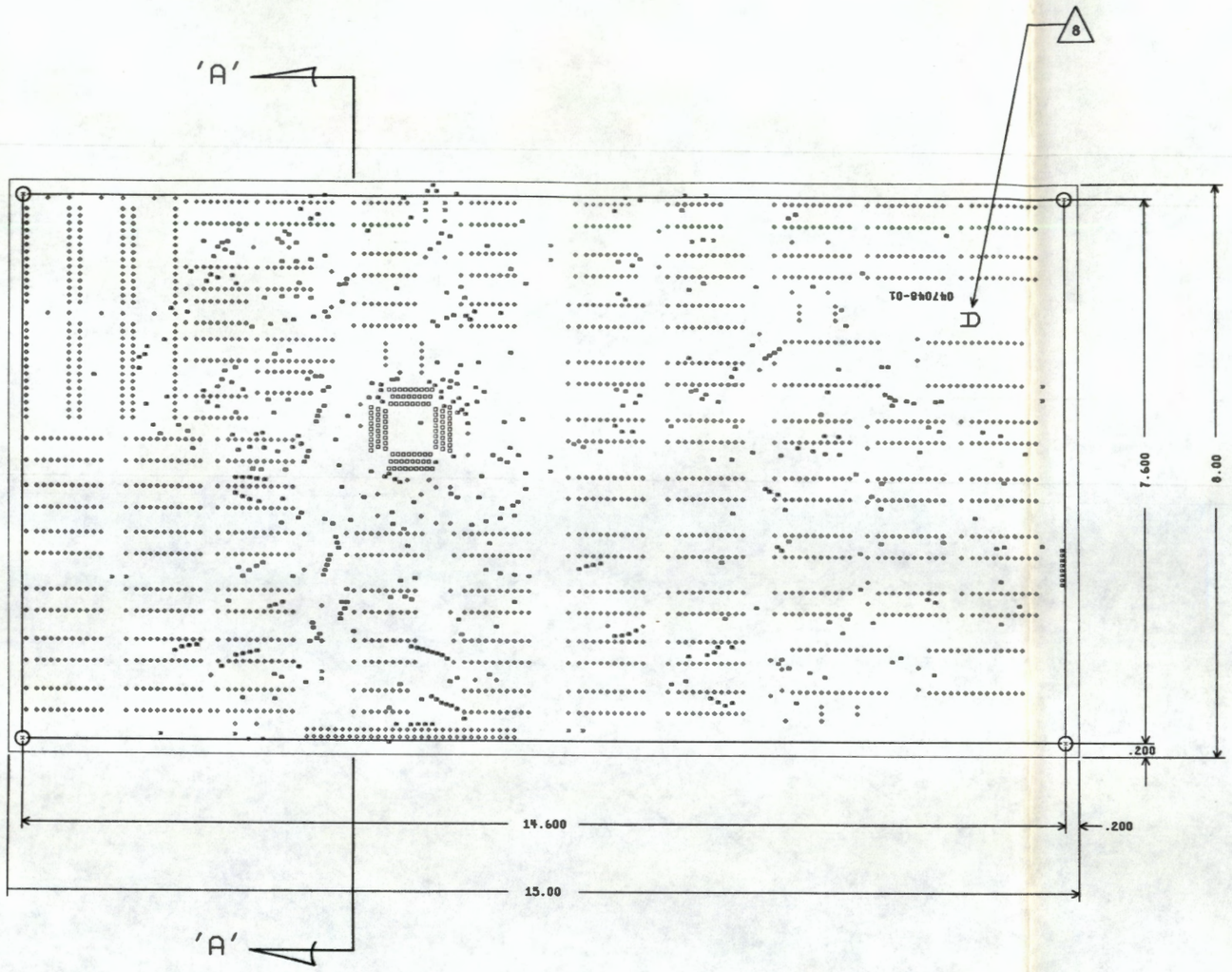
ATARI GAMES

Drawn by: STAFF	Next Assy:
Checked by: L B Fitts 4-1-91	
Design Eng:	Comp. Eng:
Proj. Eng: J. Margolin 4-1-91	Mfg. Eng: 4-1-91
Ind. Design:	Qual. Eng:

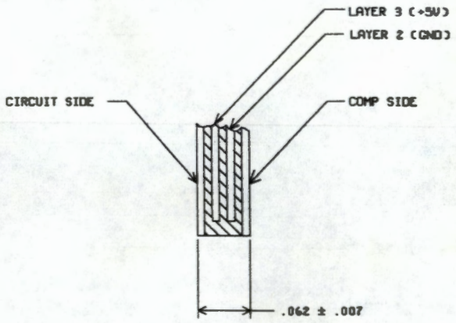
REV	DESCRIPTION	DATE	APPR	REV	DESCRIPTION	DATE	APPR
A	PRODUCTION RELEASE	4-1-91	jm				

ITEM	PART NO	QTY	Description	Ref. Designators
1	A047047-01	1	ASSY, SUB, ADSP II PCB	
2				
3				
4				
5	137629-001	1	IC, ADSP-2100, 16 BIT DSP, PQFP	ADSP2100
6	179288-002	1	COVER, IC, PQFP, 100 PIN	ADSP2100
7				
8	136088-1017	1	IC, EPROM,27512,200NS,137448-200	9/10K
9	136088-1018	1	IC, EPROM,27512,200NS,137448-200	9/10H
10				
11	136088-1019	1	IC, EPROM,27512,200NS,137448-200	10K
12	136088-1020	1	IC, EPROM,27512,200NS,137448-200	10H
13				
14	136088-1021	1	IC, EPROM,27512,200NS,137448-200	9K
15	136088-1022	1	IC, EPROM,27512,200NS,137448-200	9H

REVISIONS					
SYM	DESCRIPTION	DATE	INCORP	CHECK	APPROVED
A	PRODUCTION REL	6-21 1989	LBF	JD	



CIRCUIT SIDE



SECTION 'A-A'

9 SCALE: NONE

DRILL TABLE CHART			
SYMBOL	FINISHED DIA	QTY	PLATED THRU
◇	.040 ±.003	2068	YES
A	.047 ±.003	24	YES
B	.028 ±.003	442	YES
□	.026 ±.002	100	YES
H	.191 ±.003	4	YES

NOTES:

1. MATERIAL:BASE LAMINATE,COPPER CLAD GLASS BASE,EPOXY RESIN, FLAME RETARDANT,1 OZ COPPER ON ALL INTERNAL LAYERS,1 OZ COPPER ON EXTERNAL LAYERS SHALL BE IN ACCORDANCE WITH MIL-P-55617. BONDING AGENT:PRE-IMPREGNATED-B STAGE (UNCURED RESIN SHEET) SHALL BE IN ACCORDANCE WITH IPC-L-110.
2. PLATING:SOLDER PLATE, ~~INCLUDING PC FINGERS (CONNECTOR).~~
3. MAX. TWIST OF WARP PERMITTED IS .005 PER INCH.
4. VENDOR LOGO TO BE ADDED TO BOARD IN CLEAR AREA.
5. SOLDERMASK BOARD WITH PC-401 OR EQUIV,BOTH SIDES.
6. FABRICATE PER ATARI PC BOARD MANUFACTURING SPECIFICATION 190012.
7. SILK SCREEEN COMPONENT SIDE OF BOARD USING PERMANENT-TYPE YELLOW EPOXY INK.

8 CURRENT REVISION LEVEL OF FILM TO FABRICATE BOARD TO BE SHOWN ON CIRCUIT SIDE.

9 AS VIEWED FROM THE COMPONENT SIDE,LAYER SEQUENCE NUMBERS MUST READ IN ORDER 'COMP,2,3,CIRCUIT'.

10 TOOLING HOLES TO BE CLEAR OF SOLDERMASK .50 DIA., 4PLCS.

11. BOARD TO BE FABRICATED USING 'FINE LINE' TECHNOLOGY.
    MAXIMUM OVER-ETCH ALLOWED .0020
    MAXIMUM UNDER-ETCH ALLOWED .0010
12. ALL BOARDS TO BE 100% ELECTRICALLY TESTED FOR SHORTS AND OPENS.

A047047-01	DRIVER SIMULATOR
NEXT ASSY	FIRST USED ON

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON:
ANGLES ± 1°
.XX =± .01
.XXX =± .005

MATERIAL: SEE NOTE 1.

FINISH: SEE NOTE 2.

DRAWN BY	L.FRITTS	DATE 6-21-89
CHECKED BY	J.DIEU	DATE 6-21-89
ENGR,ELECT	J. Margolin	DATE 6-21-89
HARNESS DESIGN		DATE
PROJ ENGR		DATE

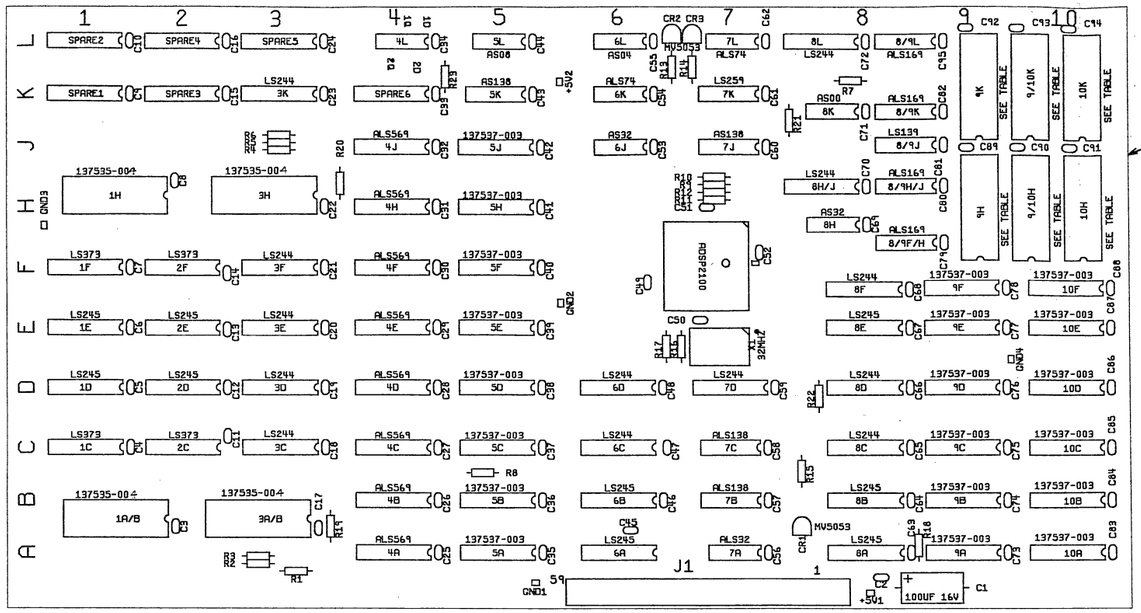
ATARI GAMES

ATARI GAMES CORP.
675 SYCAMORE DRIVE
MILPITAS,CAL. 95035

TITLE
FABRICATION,
ADSP II PCB

SIZE	DRAWING NO.	REV
D	047048-01	A

SCALE 1:1 SHEET 1 OF 1



REVISIONS					
SYM	DESCRIPTION	DATE	INCORP	CHECK	APPROVED
A	PRODUCTION RELEASE	6-21-1989	LBF	JD	JM
B	REVISED PER ECN 13811	3-29-90	DIEU	JD	JM
C	ECN 13954	7-31-90	LBF	JD	JM

LOC	ATARI PART NO. A047046-01	ATARI PART NO. A047046-02	ATARI PART NO. A047046-03
9/10K	136070-XX17	136052-XX36	136077-XX23
9/10H	136070-XX18	136052-XX35	136077-XX21
10K	136070-XX19	136052-XX38	136077-XX24
10H	136070-XX20	136052-XX37	136077-XX22
9K	136070-XX21	———	———
9H	136070-XX22	———	———

COMPONENT SIDE

NOTES: FOR ASSY'S A047046-01,-02 AND -03

1. INSTRUCTIONS FOR ASSEMBLY OF ADSP2100 DEVICE.
   1. ALIGN THE PIN NO. 1 IDENTIFIER ON THE PQFP (ITEM5) WITH TRIANGULAR IDENTIFIER ON THE RYTON COVER (ITEM 6). FULLY INSERT THE PQFP. A CLICK WILL BE AUDIBLE. BE SURE ALL LEADS OF THE PQFP ARE LOCATED IN THE ALIGNMENT COMBS ON THE UNDERSIDE OF THE COVER.
   B. PLACE THE COVER ON THE HOUSING BEING SURE TO MATCH THE CHAMFERED CORNER ON THE COVER WITH THE CHAMFERED CORNER ON THE HOUSING.
   C. BEING SURE NOT TO PUSH ON THE PQFP ITSELF, PUSH WITH YOUR THUMBS ON TWO (2) OPPOSITE SIDES OF THE COVER UNTIL THE COVER IS FULLY SEATED, CHECK TO SEE THAT NO GAP EXISTS BETWEEN THE COVER AND THE HOUSING.
   D. IT MAY BE NECESSARY TO REPEAT STEP C. USING THE OTHER TWO OPPOSITE SIDES OF THE COVER.

2. INSTRUCTIONS FOR DISASSEMBLY OF ADSP2100 (IF EXTRACTION TOOL IS NOT AVAILABLE)
   A. TO DISASSEMBLE, PRY COVER FROM SOCKET HOUSING USING A SMALL SCREWDRIVER OR FLAT BLADE. (CORNER EDGE UNDERCUT IN (3) THREE PLACES. PRY IN A ROTATING FASHION.)
   B. REMOVE PQFP FROM COVER USING FINGER PRESSURE, BEING CAREFUL NOT TO BEND LEADS ON PQFP.

A047046	DRIVING SIMULATOR
NEXT ASSY	FIRST USED ON

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON:
ANGLES ± 1°
.XX = ± .01
.XXX = ± .005

MATERIAL:
SEE P/L
A047047-01
A047046-01,02,03

FINISH:

		DATE
DRAWN BY	L.FRITTS	6-21-89
CHECKED BY	J.DIEU	6-21-89
ENGR,ELECT	J MARGOLIN	6-21-89
PROJ ENGR		
MFG ENGR	D WRIGHTNOUR	6-22-89

ATARI GAMES CORP.
675 SYCAMORE DRIVE
MILPITAS,CA 95035

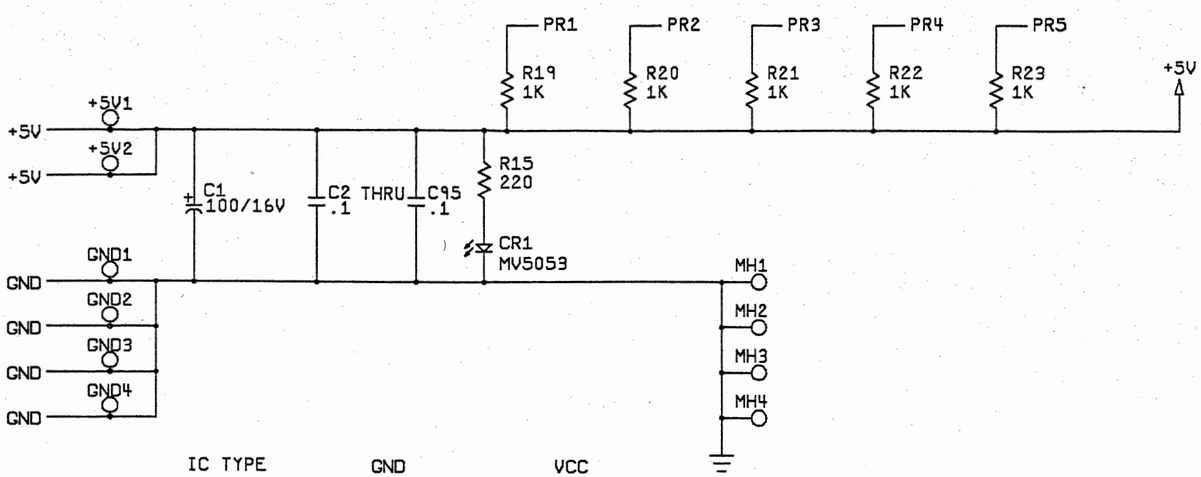
TITLE
ASSEMBLY,
ADSP II PCB

SIZE	DRAWING NO.	REV
D	A047047-01	C

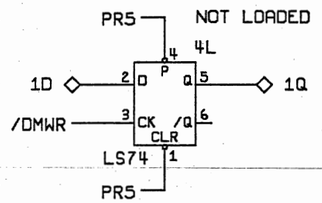
SCALE 1:1 SHEET 1 OF 1

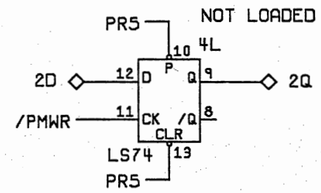
DSHT15

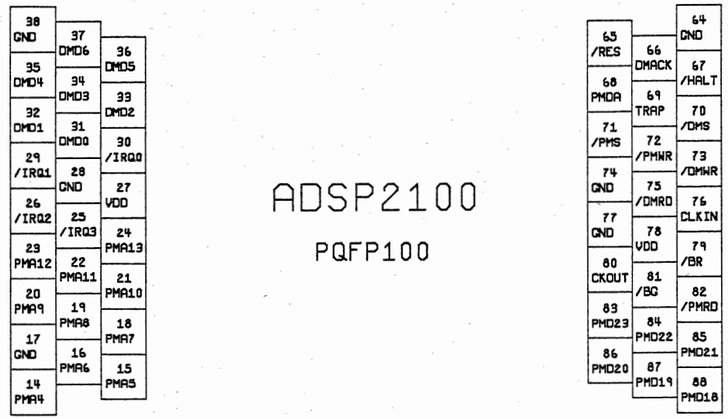
REVISIONS					
STM	DESCRIPTION	DATE	INCORP	CHECK	APPROVED
A	PRODUCTION REL	6-20 1989	LBF		
B	ECN 13811	3-29 90	JD		
C	ECN 13954	7-31 90	LBF		



IC TYPE	GND	VCC
74LS00	7	14
74LS08	7	14
74LS175	8	16
74LS244	10	20
74LS245	10	20
74LS253	8	16
74LS259	8	16
74LS373	10	20
74LS374	10	20
74LS74	7	14
74ALS20	7	14
74ALS32	7	14
74ALS74	7	14
74ALS138	8	16
74ALS169	8	16
74ALS569	10	20
74AS00	7	14
74AS04	7	14
74AS08	7	14
74AS32	7	14
74AS74	7	14
74AS138	8	16
4K X 4 SRAM	10	20
8K X 8 SRAM	14	28
27512	14	28
ADSP2100PQFP	6 17 28 38 56 64 74 77 99	2 27 53 78







ADSP2100

PQFP100

BOTTOM VIEW

(PINS UP)

A047047-01	DRIVING SIMULATOR
NEXT ASSY	FIRST USED ON

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON:
ANGLES ± 1°
.XX ±.01
.XXX ±.005

MATERIAL:
SEE PL
A047047-01
A047046-01,-02

FINISH:

		DATE
DRAWN BY	L.FRITTS	6-20-89
CHECKED BY	JD	6-21-89
ENGR,ELECT	J. Margolin	6-21-89
PROJ ENGR		DATE
MFG ENGR		6-22-89

ATARI

ATARI GAMES CORP.
675 SYCAMORE DRIVE
MILPITAS, CA. 95035

TITLE
SCHEMATIC
ADSP II PCB

SIZE	DRAWING NO.	REV
D	047047-01	C

SCALE NONE SHEET 1 OF 9

SCHSHT1.9

AM/PM1

J1-1 A01
J1-2 A02
J1-3 A03
J1-4 A04
J1-5 A05
J1-6 A06
J1-7 A07
J1-8 A08
J1-9 A09
J1-10 A10
J1-11 A11
J1-12 A12
J1-13 A13
J1-14 A14
J1-15 A15
J1-16 A16
J1-17 A17
J1-18 A18
J1-19 A19
J1-20 A20
J1-21
J1-22
J1-23 /EXT
J1-24 (/AS)
J1-25
J1-26
J1-27 RWN
J1-28 /RVAS
J1-29 /RWS

+5V

AM/PM1

J1-30 D00
J1-31 D01
J1-32 D02
J1-33 D03
J1-34 D04
J1-35 D05
J1-36 D06
J1-37 D07
J1-38 D08
J1-39 D09
J1-40 D10
J1-41 D11
J1-42 D12
J1-43 D13
J1-44 D14
J1-45 D15
J1-46
J1-47
J1-48 (/MHALT)
J1-49 (/MRESET)
J1-50
J1-51 (/LINKIRQ)
J1-52 (/WEU)
J1-53 (/WEL)
J1-54 /ADSPIRQ
J1-55
J1-56
J1-57 (SC8MA)
J1-58
J1-59 (SC16MA)
J1-60

+5V

RWN → 6L 74AS04 → /RWN

A18 → 6L 74AS04

7A 74ALS32: A19, A20

7B 74ALS138: G1 ← A18, G2A ← 7A, G2B ← /EXT, SELC ← A17, SELB ← A16, SELA ← A15
- Y7 → /READSTAT
- Y6
- Y5
- Y4
- Y3 → /ASEL
- Y2 → /BUFFERMEM
- Y1
- Y0

7D 74LS244B: /1G, /2G ← PR4
- A07 → BA07
- A06 → BA06
- A05 → BA05
- A04 → BA04
- A03 → BA03
- A02 → BA02
- A01 → BA01

7A 74ALS32: /RVAS, /DATAMEM → /DATAMEM

7A 74ALS32: /PROGMEM → /PROGMEM

7C 74ALS138: G1 ← PR4, G2A ← /RWS, G2B ← /ASEL, SELC ← BA07, SELB ← BA06, SELA ← BA05
- Y3 → /CCINT
- Y0 → /LATCHES

74LS259: 7K DI ← BA04, SELC ← BA03, SELB ← BA02, SELA ← BA01, G ← /LATCHES, CLR ← PR3
- Q7 → /ADSPRES
- Q6 → /ADSPHALT
- Q5 → /ADSPBR
- Q3 → /BCON

6L 74AS04: /BCON → BCON

R13 150 → MV5053 CR2 → +5V

R14 150 → MV5053 CR3 → +5V

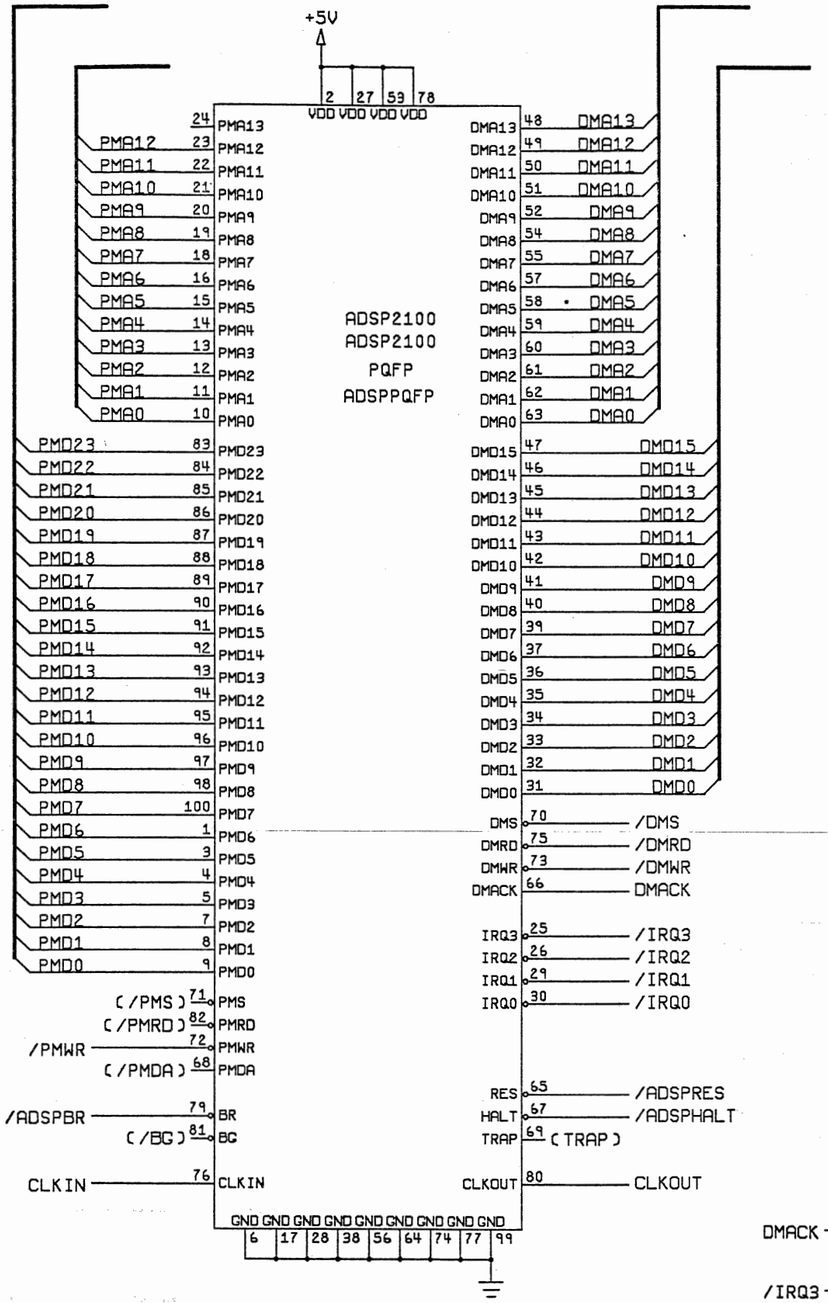
ATARI

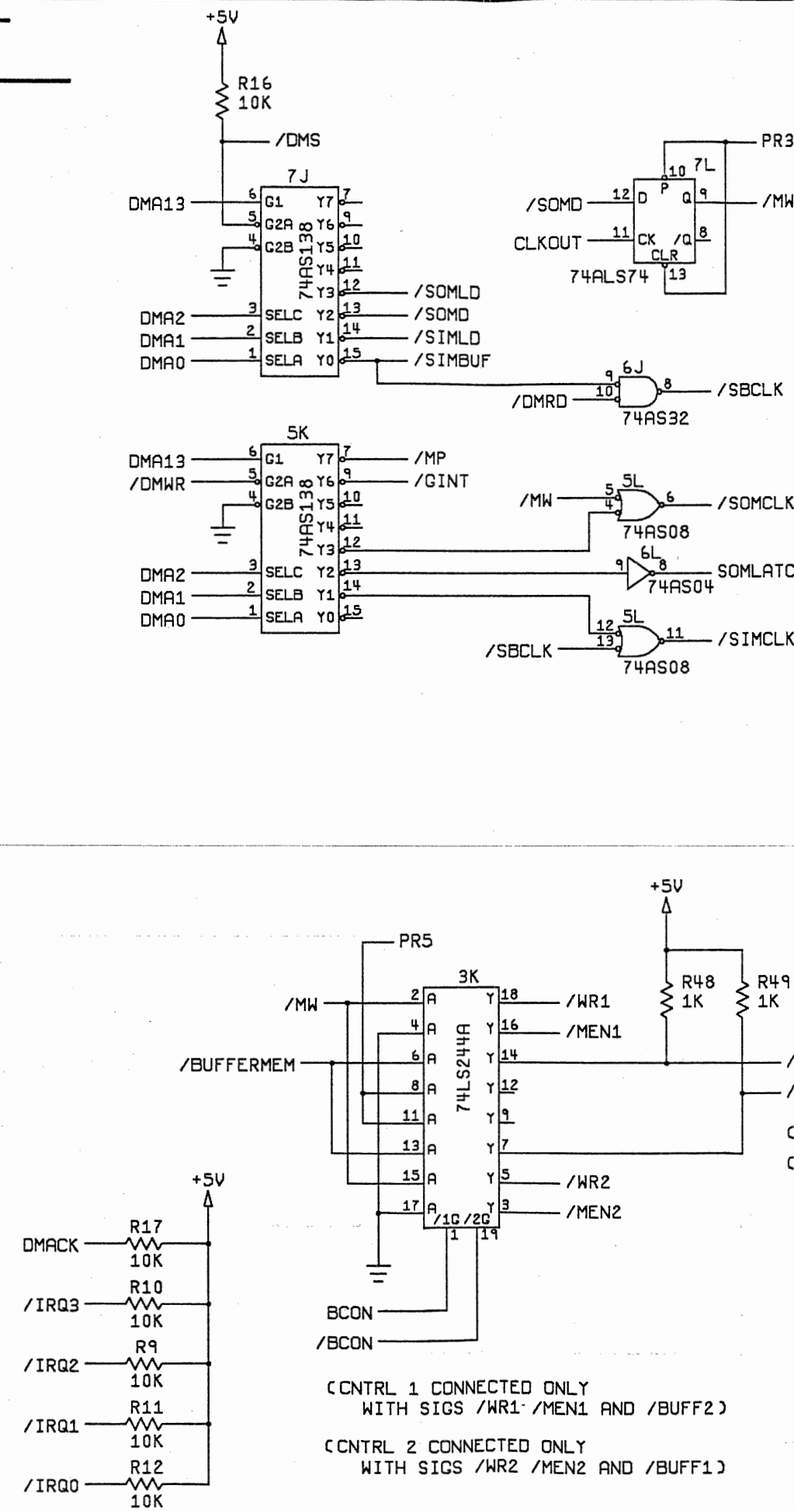
ATARI GAMES CORP.
675 SYCAMORE DRIVE
MILPITAS, CA. 95035

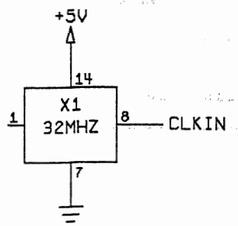
TITLE
SCHEMATIC
ADSP II PCB

SIZE	DRAWING NO.	REV
D	047047-01	C
SCALE NONE	SHEET 2 OF 9	

SCHSHT2.A







(CNTRL 1 CONNECTED ONLY
WITH SIGS /WR1 /MEN1 AND /BUFF2)

(CNTRL 2 CONNECTED ONLY
WITH SIGS /WR2 /MEN2 AND /BUFF1)

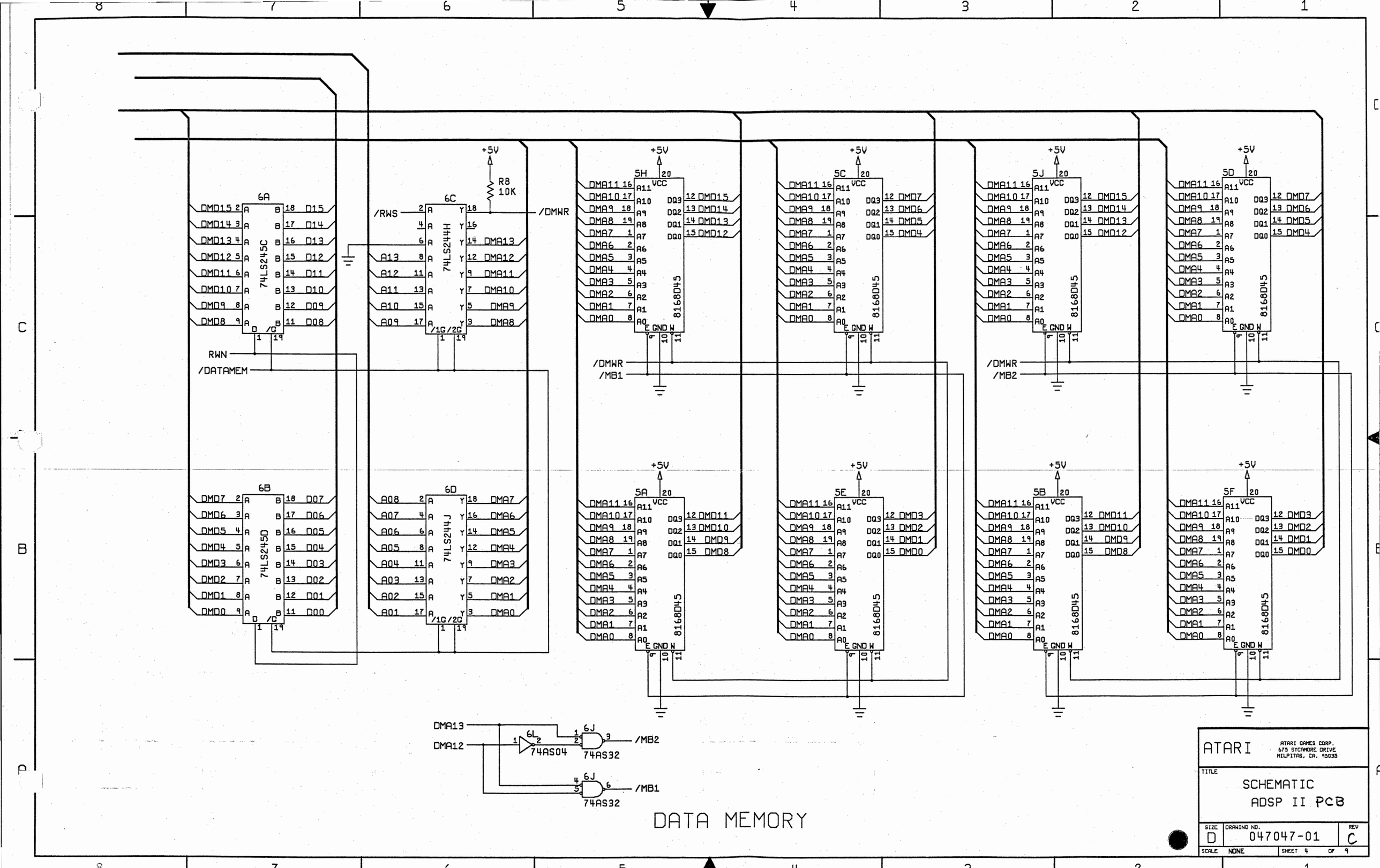
ATARI

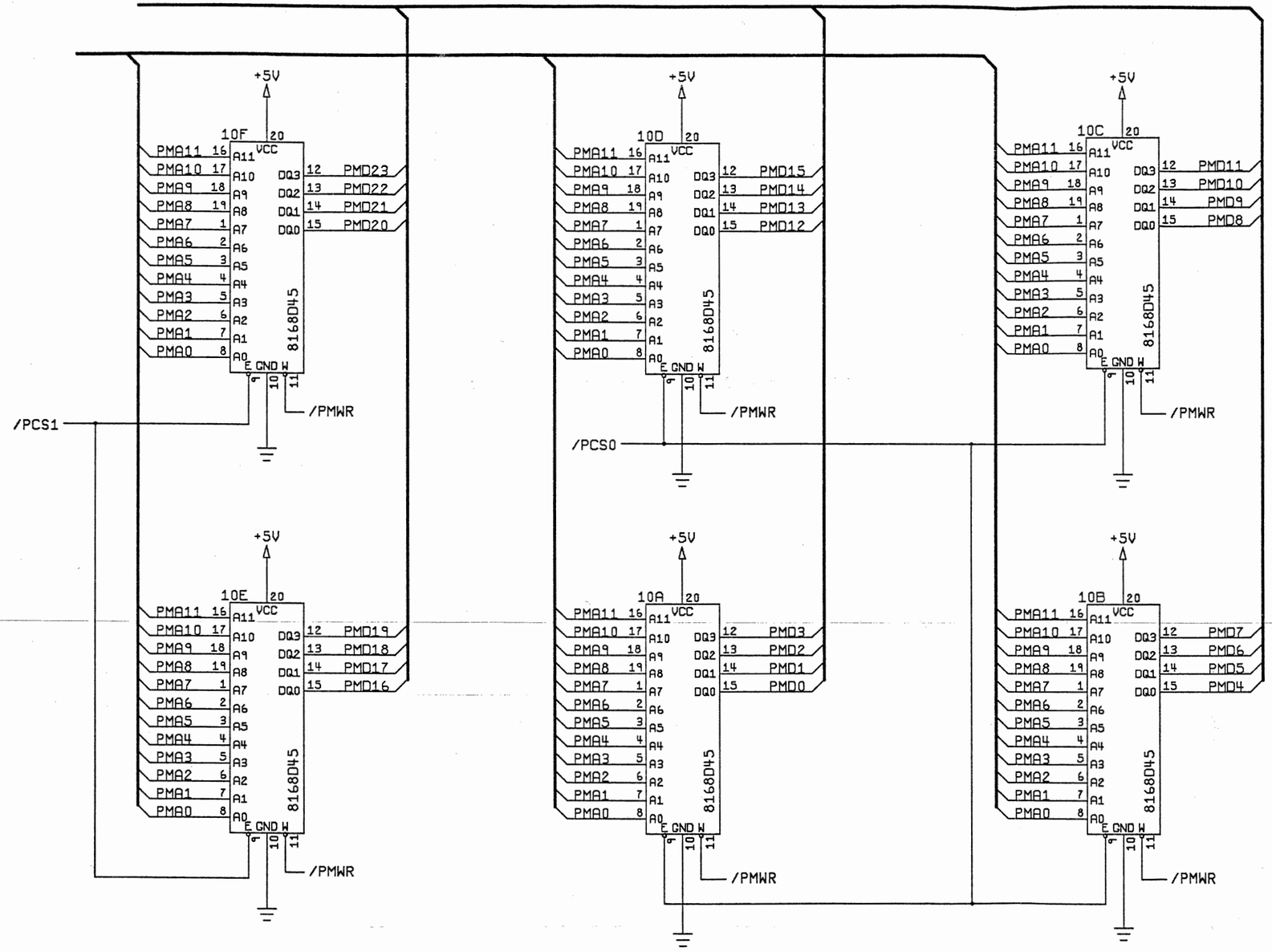
ATARI GAMES CORP.
675 SYCAMORE DRIVE
MILPITAS, CA. 95035

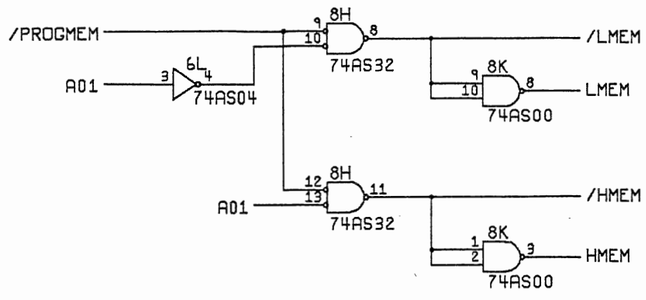
TITLE
SCHEMATIC
ADSP II PCB

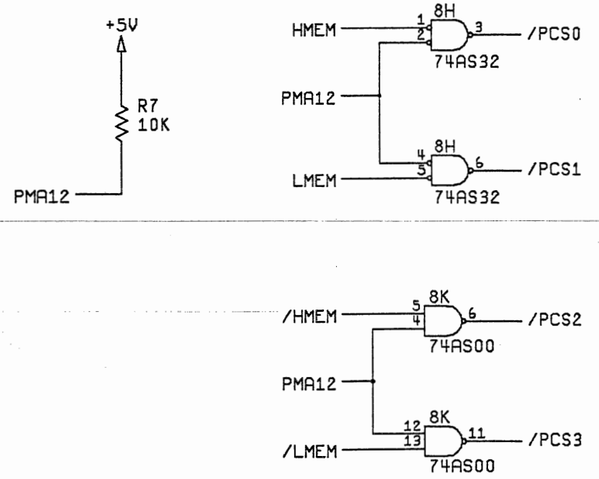
SIZE	DRAWING NO.	REV
D	047047-01	C

SCALE NONE | SHEET 3 OF 9


6A
74LS245C
DMD15 DMD14 DMD13 DMD12 DMD11 DMD10 DMD9 DMD8
D15 D14 D13 D12 D11 D10 D09 D08
RWN
/DATAMEM
6C
74LS244H
+5V
R8
10K
/RWS
/DMWR
A13 A12 A11 A10 A09
DMA13 DMA12 DMA11 DMA10 DMA9 DMA8
5H
5C
5J
5D
8168D45
DMA11 DMA10 DMA9 DMA8 DMA7 DMA6 DMA5 DMA4 DMA3 DMA2 DMA1 DMA0
DMD15 DMD14 DMD13 DMD12
DMD7 DMD6 DMD5 DMD4
/DMWR
/MB1
/MB2
6B
74LS245D
DMD7 DMD6 DMD5 DMD4 DMD3 DMD2 DMD1 DMD0
D07 D06 D05 D04 D03 D02 D01 D00
6D
74LS244J
A08 A07 A06 A05 A04 A03 A02 A01
DMA7 DMA6 DMA5 DMA4 DMA3 DMA2 DMA1 DMA0
5A
5E
5B
5F
DMD11 DMD10 DMD9 DMD8
DMD3 DMD2 DMD1 DMD0
6L
74AS04
6J
74AS32
DMA13
DMA12
/MB2
/MB1
DATA MEMORY
ATARI
ATARI GAMES CORP.
675 SYCAMORE DRIVE
MILPITAS, CA. 95035
TITLE
SCHEMATIC
ADSP II PCB
SIZE D
DRAWING NO. 047047-01
REV C
SCALE NONE
SHEET 4 OF 9
SCHSHT2 A



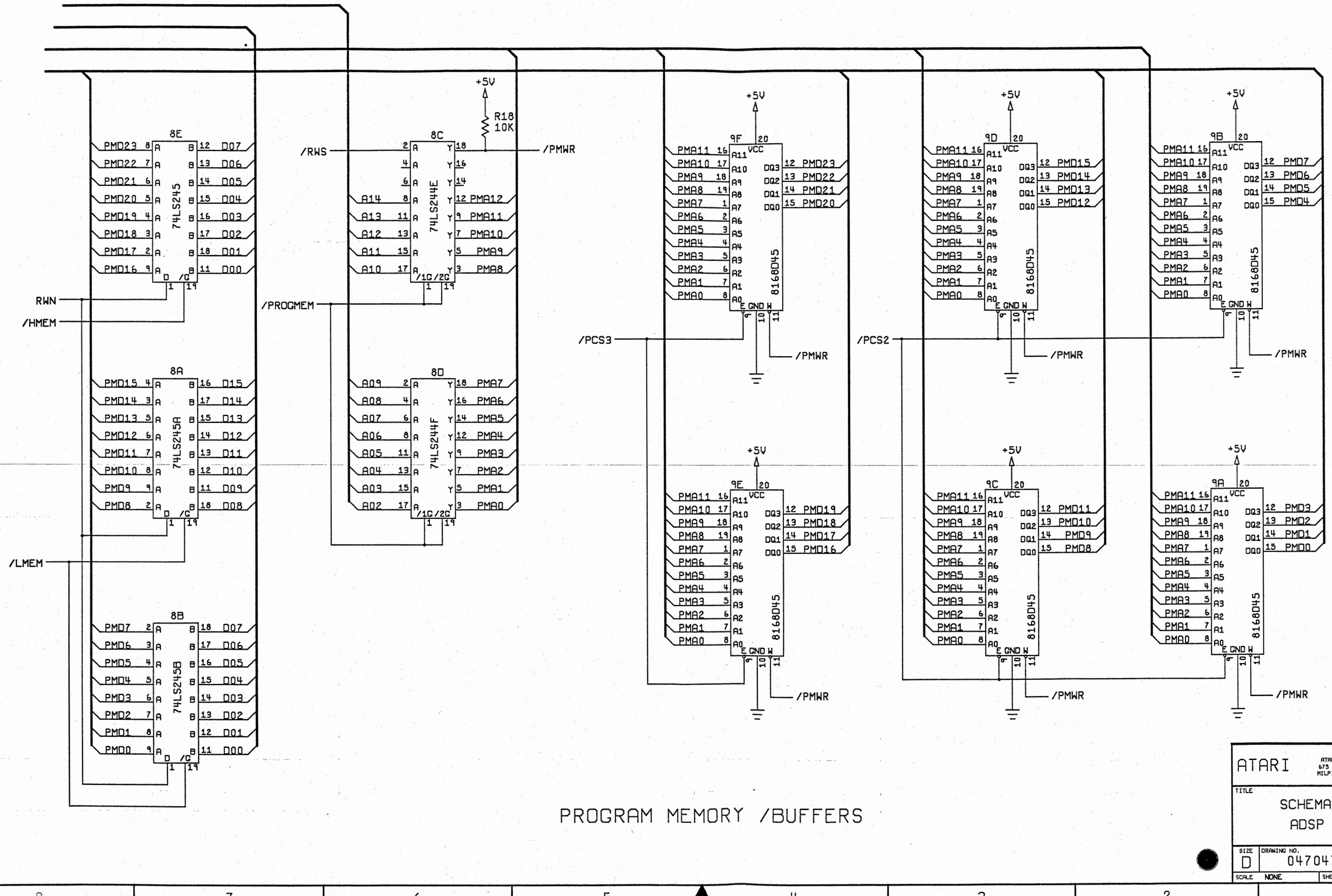




PROGRAM MEMORY

ATARI	ATARI GAMES CORP. 675 SYCAMORE DRIVE MILPITAS, CA. 95035
TITLE	SCHEMATIC ADSP II PCB
SIZE D	DRAWING NO. 047047-01
REV C	
SCALE NONE	SHEET 5 OF 9

SCHSHT2.3



PROGRAM MEMORY /BUFFERS

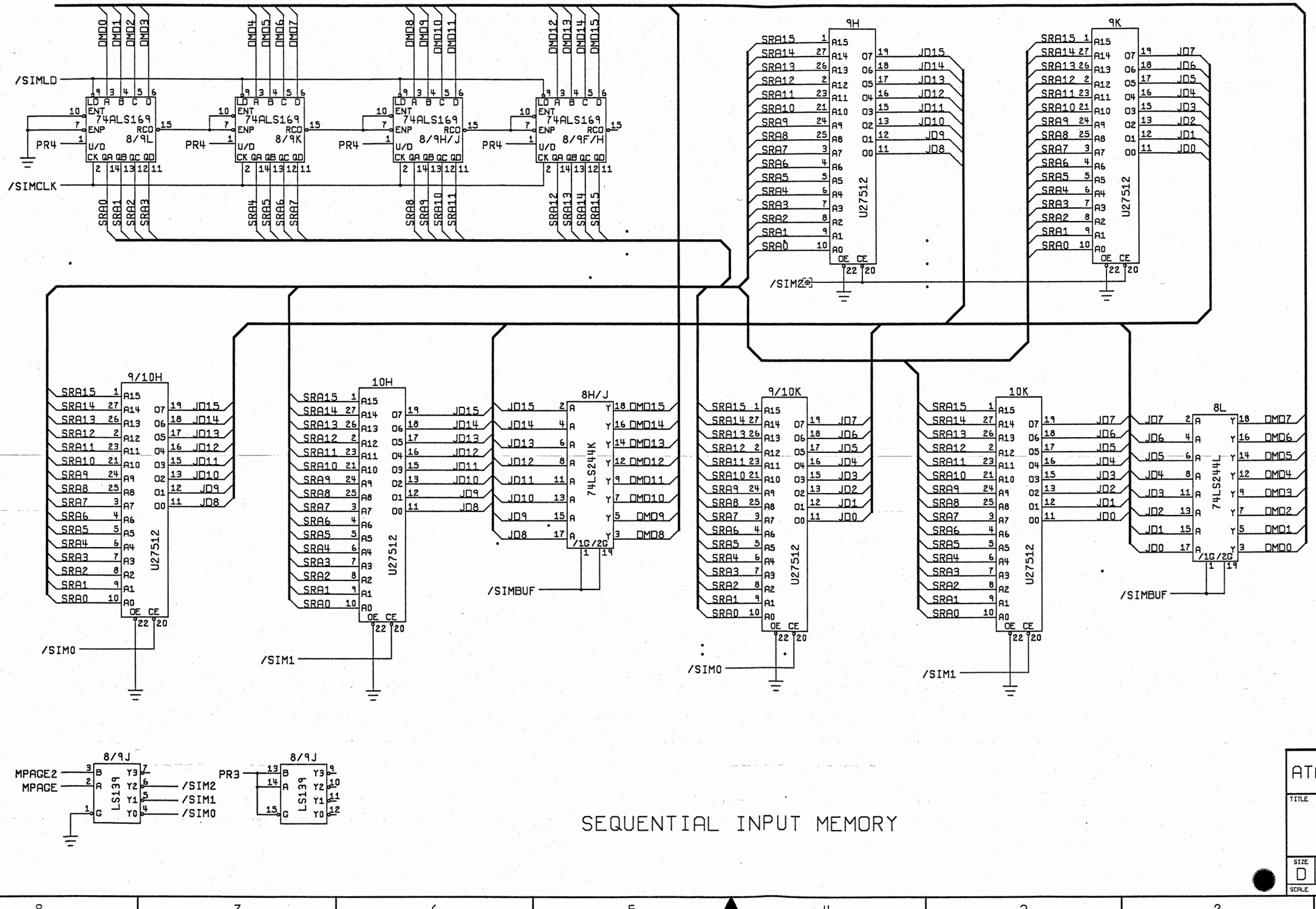
ATARI — ATARI GAMES CORP. 675 SYCAMORE DRIVE MILPITAS, CA. 95035

TITLE: SCHEMATIC ADSP II PCB

SIZE	DRAWING NO.	REV
D	047047-01	C

SCALE NONE — SHEET 6 OF 9

SCHSHT2 A



SEQUENTIAL INPUT MEMORY

ATARI

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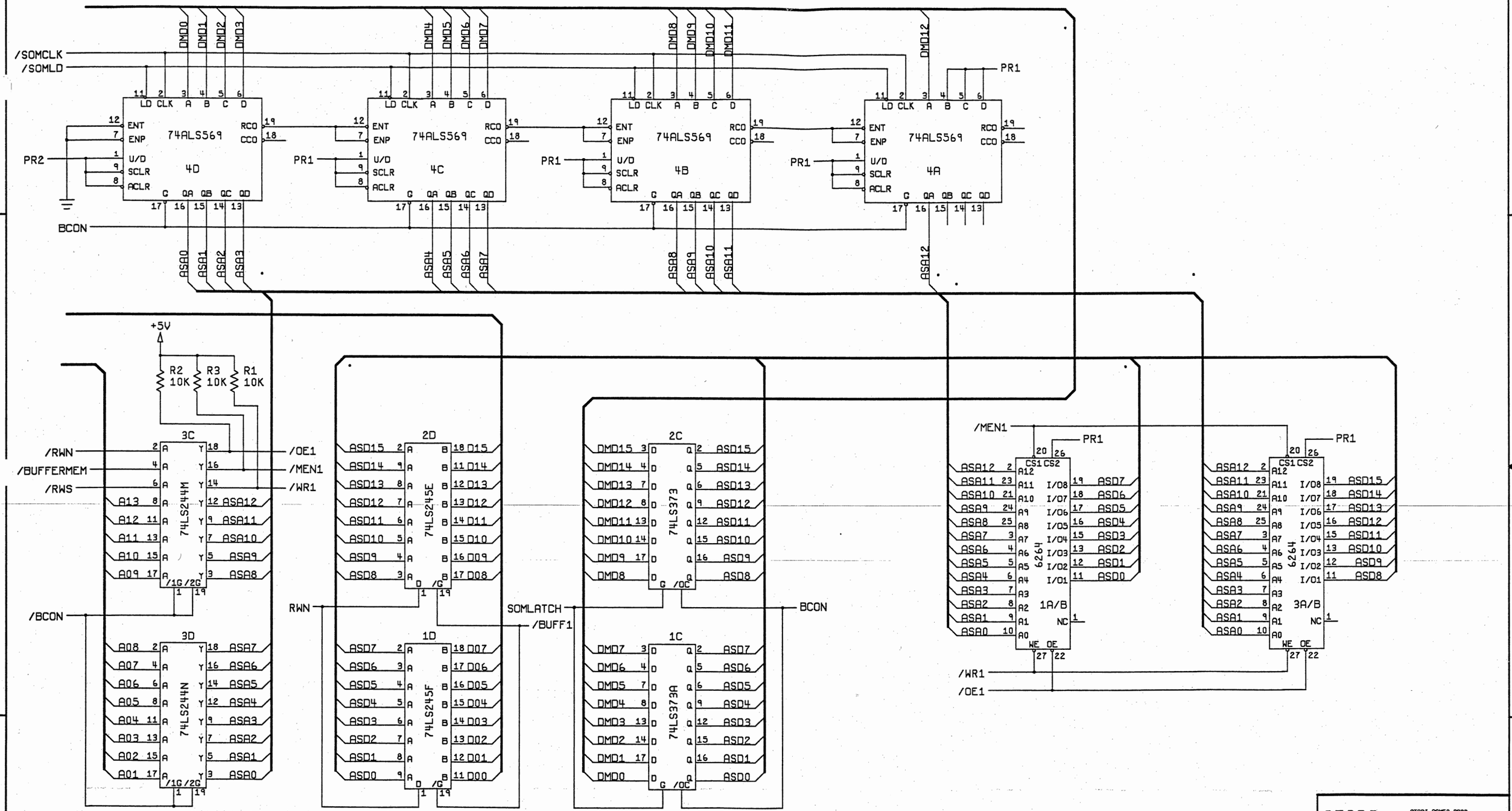
675 SYCAMORE DRIVE
MILPITAS, CA. 95035

TITLE
SCHEMATIC
ADSP II PCB

SIZE	DRAWING NO.	REV
D	047047-01	C
SCALE NONE	SHEET 7 OF 9	

SCHSHT2 A



SEQUENTIAL OUTPUT MEMORY #1

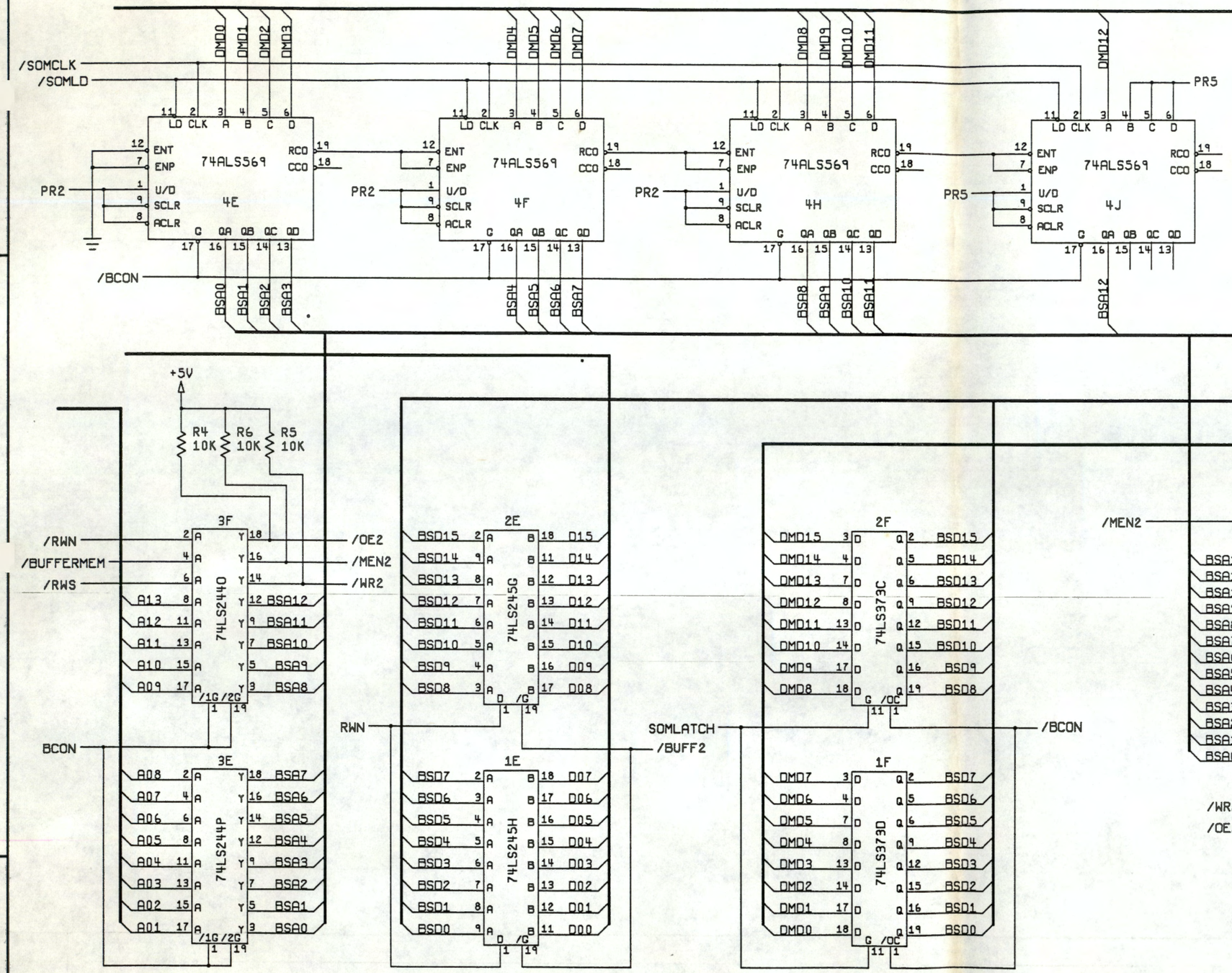
ATARI

ATARI GAMES CORP.
675 SYCAMORE DRIVE
MILPITAS, CA. 95035

TITLE
SCHEMATIC
ADSP II PCB

SIZE	DRAWING NO.	REV
D	047047-01	C
SCALE NONE	SHEET 8 OF 9	

SCHSHT2 A



SEQUENTIAL OUTPUT MEMORY #2

ATARI	ATARI GAMES CORP. 675 SYCAMORE DRIVE MILPITAS, CA. 95035	
TITLE: SCHEMATIC ADSP II PCB		
SIZE: D	DRAWING NO.: 047047-01	REV: C
SCALE: NONE	SHEET 9 OF 9	

SCHSHTZ A